
Landscape Design for Children and Their Environments in Urban Context

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<http://dx.doi.org/10.5772/55751>

1. Introduction

One of the most important topics of landscape architecture profession is to design high-quality open spaces for people to meet their needs and expectation. These open spaces range from smaller-scale residential gardens, used by certain number of people, to large city parks, used by people with different age groups and the crowded masses. These different open spaces and differences in uses lead to changes in the needs and expectations. Therefore, it is necessary to know well about the needs and expectations of people when designing spaces for them.

Children constitute a significant part of users in urban open spaces. Because children's time, spent in open spaces with play during the development, is extremely important and necessary in terms of physical social, emotional, and cognitive aspects. Therefore, nature of the play space is very important. Because, the elements, facilities and quality of a space also affect the quality of the play. As it will be discussed in the following sections of this text, when importance of play for children is considered, the design of open spaces for children becomes an extremely important issue.

Today cities are getting crowded due to the variety of business and social opportunities offered to the people. Due to the increasing population density and intensive construction, open spaces that children can use are decreasing. In this context, introducing new and alternative play spaces and play options are a solution. It is extremely important that designed play areas should be qualified to meet children's needs and desires and to make positive contributions to their development.

This chapter focuses on landscape designs for children, particularly in urban spaces. At this point, the subject will be discussed in terms of landscape design, children, and urban context. First, it will be focused on the general definition of landscape design, interests, and

the place of children's play areas among them. Second, the concept of play, the relationship of the child with their environment, open spaces, natural areas and their importance, the differences between environmental perceptions of children and adults will be mentioned. Children's needs and expectations in urban open spaces will also be discussed. Third, all of above mentioned issues will be evaluated in terms of urban context with playgrounds examples selected from around the world. Finally, in the light of all this information and assessments, children's expectations from open spaces, design process of children's play areas and considerations to design an ideal playground will be presented.

2. Landscape design

"Landscape, originates from French word "paysage" which means scenery. Nowadays, the word encompasses a wider and deeper meaning. While in the medieval period, "landscape" was used as a synonym for "region" and "territory" in most of the Germanic languages, beginning from the 15th century landscape became a pictorial genre. The use of landscape as a term in science is relatively new. Today, landscape refers to not only a phenomenon described and analyzed by scientific methods, but also a subjective experience which has perspective, aesthetical, artistic and existential meaning" (Memlük, 2012).

Design is the creative process of responding to conditions and concentrating meaning; and landscape design is the creation of responsive, evocative, meaningful, sustainable, and regenerative landscapes (Motloch, 2000). In other words "landscape design is the art and science of organizing and enriching outdoor space through the placement of plants and structures in agreeable and useful relationship with the natural environment" (Van Der Zanden and Rodie, 2008, Adapted from the Nebraska Master Gardener Handbook, 1994).

A designer must handle both aesthetics and function at the same time in the designs. Because one cannot exist without the other in quality design (VanDerZanden and Rodie, 2008). Especially, when the area is considered for children, function is more important. Because children evaluate the environment with its functional rather than its esthetical features. The aim of the landscape design is to build up qualified spaces in open areas for people. Open areas that are the interest of landscape design may be urban or rural and private or public. In this article urban landscape will be emphasized. "From a wider perspective, urban landscape is a part of urban matrix. Therefore design of urban landscapes should be considered as an integral part of urban design. Urban landscape design is clearly not urban design, but a crucial part of it. Hence, factors influencing urban design also influence the form and functioning of urban landscapes (Memlük, 2012).

There are lots of spaces, having different functions, that can be subject of landscape design in urban. Some of them may be ranged as urban squares, public gardens, playgrounds, open areas of public institutes such as education, health...etc. and yards. Each of these spaces requires different activity fields according to their users and locations. Among these spaces, children's play areas have an important place because playing in open areas in the childhood period is extremely important for children's healthy development.

3. Children

When designing places for people, the first necessary thing is to know the users of these places. In this way, it would be possible to determine the user's needs and expectations. Places to meet these needs are preferred and used by users. Therefore, design for children requires to know the child, to understand the importance and necessity of play for child, and to know activities children do and want to do especially in public areas.

Play and importance of play for children

When you think of a child, the first thing that comes to mind is play. The play is a concept of universal that extremely important for the development of child's personality. There are many definitions of play in the literature.

According to the Winnicott 'to play is to use imagination, the most important thing a person can do...Play is always an experience of creating, also of uniting time and space- so is fundamental to how we live'(Day and Midbjer, 2007).

Moore (1990) states that "play lies at the heart of childhood, limited in its boundaries only by the opportunities afforded by physical settings and by the attitudes and commitment of those whose business it is to manage them" (Jones, 1997).

According to Piaget, play is not a condition of mental, but is a behavior or action and it causes the child makes effort about what to do. According to him, the play is necessary for the development of intelligence (Piaget and Inhelder, 1971).

Play is a form of behavior which has many definition, description and developmental theories (Piaget and Inhelder, 1971; Jones, 1997). As a result, if we need to briefly mention, the play refers to a unscheduled, spontaneous situation. It is possible to mention the four assumptions about the play (Jones, 1997). These are listed as follows;

1. children learn during the play and play is necessary for the child's development and growth,
2. the play is not limited to younger children, it is an important concept in adults' life-cycle,
3. to play outside is an important need because it offers opportunities not found anywhere else,
4. play environments are educational areas

Children obtain feelings of achievement and self-security, of being together with others, respect for themselves and others as a result of playing the play (Day and Midbjer, 2007).

Play is an extremely important concept in terms of children's rights. The International Play Association (IPA) Declaration of the Child's Right to Play was introduced in November 1977 at the IPA Malta Consultation held in preparation for the International Year of Child (1979) (Clements and Fiorentino, 2004). Play was emphasized that nutrition, health, housing and education, as well as of vital importance for the development potential of each child in this declaration (Yılmaz and Bulut, 2003).

Experts working on childhood states that the best learning is provided through play and exploration for children (Vicki and Stoecklin, 2004). A child learns and discovers himself and his environment during the play. During the play, children use objects to learn how to use them, perform activities with them and recognize them. Children should change the places of them, create compositions, bring together, separate, take a piece of them, and re-install the missing part (Piaget and Inhelder, 1971). In this way, children find the opportunity to learn by trying different things. Therefore play is the child's experiment tool.

Benefits of play on the development of children can be classified under two headings. These are; the benefits of playing during the play, the benefits of playing over time. In 1978, Jones and Prescott stated that "through play, children (and bigger people, too) learn a great deal about the variety and complexity of the world, and about themselves as self-directed learners" (Jones and Prescott, in Jones, 1997).

There are also benefits that bring to the play over time, summarized as follows:

- Children gain a sense of freedom and self-confidence
- When a child's respect for other individuals increases, sharing also increases
- Children become an healthy individual both physically and mentally, the learning ability of children develop
- Children's creativity increases

Recognizing the importance of play and playing game will provide to better understand the importance of play spaces as well. Because the nature of space and its components affects children's play. As we live in an environment that surrounds us, outdoor areas where children play are not possible to think independently from the environment. In this context, the relationship between the child and their environment is important.

Child and Environment

The physical environment influences everybody's behavior (Proshansky et al., 1976; Day and Midbjer, 2007) and supports the formation of self-identity during childhood years. Children obtain information about environment and interact socially as a result of their experiences in the physical environment. In order to learn about the environment children need actively use and explore the environment. They invest certain meanings and names in special environments for themselves. The importance of these special environments continues through adulthood period. This sense of attachment and meaning of color, smell and texture of special places has been studied by educators and designers (Francis, C. 1997). Studies on this subject and the remaining images in the minds of children about their environment can be evaluated in future play space design.

Individuals' motivation, behavior and mental health are affected between individual characteristics from the environment and the characteristics of the environment (Özdemir and Yilmaz, 2008). When we look at it in terms of children, if an environment meets the psychological needs of children, it provides satisfaction, if it does not meet, it provides dissatisfaction. In addition, motion is required in order the children get to know a place and to explore it. "Before they can locomote or move from place to place (crawl, walk, run, etc.)

independently, infants are interested in many of things that fall within their reach” (Bell, 2008). Environments that offer opportunity for movement and that offer diversity for children are more preferred. At the same time, as this kind of environment will provide an opportunity to explore, it will make positive contributions to the development of children.

Studies on children’s needs and the experiences in the environment can be found in the environmental psychology literature (Spencer and Woolley, 2000). Environmental psychology is a branch of discipline developed by Proshansky, Rivlin and Ittelson. This interdisciplinary work area includes specific research topics such as perception, cognition and social learning in the relationship between the environment and human (Loebach, 2004). In the field of environmental psychology, the best concept to assess the child’s relationship with the environment, the opportunities presented by the environment and its elements is “affordance” theory. Affordance generally refers to functional facilities offered by the environment. Firstly, it has been developed by James J. Gibson in the late 1970’s. Later, the concept of affordance used to identify children’s environment’s opportunities by many researchers particularly in Harry Heft (1988) and Marketta Kyttä (2002, 2003, 2004) (Loebach, 2004; Clark and Uzzell, 2008; Acar, 2009). Functional possibilities offered by the environment create opportunities for different activities for children (figure 1, 2, 3).



Figure 1. Sloping surfaces in any area are used to slide by children (Photo Acar, H., Rotterdam, Netherland).



Figure 2. Any object that children can enter might be a play space for them (Photo Acar, H., Den Haag, Netherland).



Figure 3. Open green spaces provide opportunities for different activities (Photo Acar, H., Paris, France).

Children use these opportunities according to their own imagination, creativity, or purposes (figure 4).



Figure 4. Children use materials in the environments according to their own purposes (Photo Acar, H., Paris, France).

These activity opportunities may be in open or closed spaces. But open areas are more important for children than closed areas.

Opportunities offered by open spaces for children

Children need environment-related experiences during the character decisive years of their life. Environmental experiences helps children prepare for their life and provide positive contributions to their development. Open spaces are important places for obtaining these experiences because play outside offers a direct relation with environment and makes children discover their environment. Therefore open areas must be provided for children to play. Outside play areas contribute to the development of children's gross motor, allow them to play freely and noisier plays, and also help them to learn about the natural environment (Wilson, 2004).

Open spaces provide more opportunity than the closed spaces with the materials they have (Heerwagen and Orians, 2002; Day and Midbjer, 2007; Acar, 2009). First of all, these spaces experimentally allow children to contact with their environment, to make observation and to learn natural events (change of the seasons and so on). Also, it helps children to become social because it presents the opportunity of being together with other children (figure 5, 6).



Figure 5. Open spaces provide the opportunity to be together with other children (Photo Acar, H., Paris, France).

It is possible to increase these opportunities offered by open spaces for children. The importance of children's use of open spaces is more valuable, especially in urban areas. Children's opportunity to benefit from and access to open areas is less than in the rural areas than urban areas due to security, traffic and intensive construction. Therefore, it has become more important to make the existing places more qualified.



Figure 6. Even a fountain allows children come together, to communicate, to socialize. At the same time helps them to learn issues such as to respect the rights of others and their right to self-defense (Photo Acar, H., Paris, France).

Natural materials and play potential

Natural areas, one of the open spaces, and the materials they have can provide lots of opportunity for different activities when they are used in accordance with the creativity and imagination of children. Some researchers state that experiences in natural areas play an important role on children's cognitive and affective development (Pyle, 2002; Derr, 2008). Actually these studies show that this situation is a reflection of adults' childhood experience (Derr, 2008). That is, adult's childhood experiences affect attitudes of their adulthood. Therefore, being in interaction with nature and natural materials in childhood contribute to getting information about this subject in future, being sensitive and conscious towards the environment and handing down this experience to the next generations.

Childhood is a period for exploring and it is wonderful, powerful and life-changing discoveries for many children. In this process, period of 6-12 years is considered as middle childhood (Tai et al., 2006). Especially during middle childhood, children get significant experiences and skills that they can use throughout their lives. Therefore, interaction with nature is extremely important for people during this period (Bixler et al., 2002; Tai et al., 2006; Acar, 2009).

Studies show that children have a tendency to more natural materials and these materials provides a positive contribution to their healthy development (Fjørtoft and Sageie, 2000; Fjørtoft, 2004; Taylor and Kuo, 2008; Louv, 2008). For this reason, these materials should be used in the play areas by considering their utility situations in plays and activity facilities. Especially these materials must be used in play spaces in urban areas where it is difficult to find natural areas and materials. But, it cannot be provided just by taking these materials into the playground. The important thing is that these materials should support children's activities. For example, if the climbing activity will be done by a tree instead of a climbing wall, the tree should be appropriate for children's dimensions and in an appropriate form to climb.

“As childhood has become more restricted, opportunities for interaction with nature and natural experience are even more critical” (Mark Francis, in Lyle, 1997). Interaction with nature and natural materials contribute children's physical, mental, moral and emotional development. There are strong evidences that constant change and growth in nature have a strong effect on the development of intelligence. Also, when human beings and animals are in dynamic environment containing natural areas, neural connections in the brain increase and start to be more complex. Being deprived of such rich environments can cause lack of energy and violent behavior (Tai et al., 2006).

Diversity and complexity offered by the environment support children's play. This complexity and diversity creates opportunities for social interaction and problem solving. If a play environment contains complexity and diversity, this environment will continue to attract the attention of children over time (Jones, 1997). These complexity, diversity and richness in the environment can be created more with the natural materials. Because natural materials can be evaluated in different ways in the extent of children's creativity due to their variability. Therefore, areas that have such elements will attract the attention of children for a long time.

In addition, nature's contributions to the development of children are frequently mentioned in the literature. These can be grouped under the following headings (Acar, 2009);

- Nature contributes in terms of psychological, cognitive, and emotional health, treatment of attention deficit and hyperactivity disorder, motor development, play quality, increased sensitivity to the environment, socialization
- Nature develops the imagination, creativity and social play
- Nature evokes positive emotions, sense of place
- Nature has a stimulating effect
- Nature allows thinking, observation and research
- Natural environments are rich, tutorial, educational and informative environments

Stephen R. Kellert who is social ecology expert express that children can relate to nature in three ways. These are (Kellert, 2002);

- *Direct*; there is physical contact with nature and children recognize the nature more closely.
- *Indirect*; physical contact with nature is limited and is programmed, such as zoos, botanical gardens.
- *Symbolically*; there is no physical contact with nature, children recognize the nature with materials such as book and computer.

The most ideal of these for children is direct contact with nature (figure 7). But today establishing a direct relationship with nature and access to nature's facilities are limited for children in their daily experiences. The most important factor of this is the vast majority of the population has begun to live in urban and suburban areas. In this case children see the natural areas in their environment less than children live in rural or even they cannot see, they usually go to school by service or other vehicles, they cannot have the experience or the

opportunity to explore their environment, children use more open areas under adult supervision due to security matters or they are recommended to use closed areas to play and due to the increasing constructions children can use limited areas for play. Studies about subject show that all of them effect the healthy development of children negatively. Considering we don't have a chance to change our living conditions and after that these conditions would change more against the children, especially designers who design open spaces for children have important role from now on.

"Study nature, love nature, stay close to nature. It will never fail you" Frank Lloyd Wright (Tai et al., 2006). This expression of Wright explicitly refers to the result of being in relationship with nature.



Figure 7. An activity allowing direct contact with nature- pony ride on the area- (Photo Acar, H., Paris, France)

Differences in the perceptions and expectations of children and adults about the environment

Children and adults see and perceive the world differently (Day and Midbjer, 2007) and use open spaces differently (Moore, 1991). Therefore, while making a decision about the design of open spaces we should not forget that there are differences between children's and adults' perspectives. Functional features of the environment are more important than the aesthetic features for children (figure 8). Therefore, when designing areas for children we should determine according to children's needs and desires.

Adults just focus on how to use space and they know what it is. On the other hand, for children what the space means and how they meet and experience it is more important (figure 9). "Paula Lillard distinguishes these approaches: 'children use the environment to improve themselves; adults use themselves to improve the environment. Children work for the sake of process; adults work to achieve and result. This means places-for adults-are for pre-defined purposes; but to children, they offer opportunities for things to do. Adults live (mostly) in a world of material facts-'known' and unchanging. For children, the 'real' world is often servant to an imaginary world" (Day and Midbjer, 2007).



Figure 8. Figure 8. A rock garden and rocks in the garden designed aesthetically for adults are elements seating, climbing, over and around the watch for children (Photo Acar, H., Trabzon, Turkey)



Figure 9. Figure 9. A curved equipment designed by adults for aesthetically or sitting in the shopping center can be play element to slide for a child (Photo Acar, H., Trabzon, Turkey)

For example, while adults enjoy looking at a lake, trees, the grass, these must be a tactile auditory, oral and olfactory experience for children. "It is through body contact, direct and often disorderly, that need to experience their world". Puddles of water that adults avoid are funny places splashing when pressed for children. Lush green hills adults likes looking at is a place to roll down, feel the wet soft grass, smell its green smell for a child, an experience the free fall of tumbling round and round. Adults prefer visually clean and well maintained places instead of irregular and wet grass in open spaces. However, children as one of the players that use the environment are "place-messers" (Francis, M. 1997).

The streets have always been one of the important and attractive play spaces for children (figure 10). Children meet their friends around there, get to know each other and explore the environment. The most important feature that makes streets attractive is its accessibility for

both sexes and all age groups. However, streets are thought as a transportation routes used to go from a point to b point or parking areas for vehicles by adults (Moore, 1991).



Figure 10. Streets are play spaces for children near their home (Photos Acar, H., Trabzon, Turkey)

One way to understand how children use the environment and what kind of environment they want is observing them. If the user of area that is designed for the child is apparent - for example a school or daycare garden- in order to learn the expectations of children we should observe children's behavior in the area instead of learning by interviews. In this way, it can be determined that which points in the area, when, how often, with how many people and finally and most importantly, for which activity children use. Also, children can build special places such as wooden houses, clubhouses built with waste materials, cottages, and so on, for their own needs in their environments. These places built by the children are an important indicator of their expectations from the environment. These special places are not very aesthetically pleasing but it is important for the development of children's creativity. Therefore, designers should learn to look at the environment through children's eyes or listen them while designing the spaces for children.

4. Urban context

Human has needed spaces that have different functions for various needs and wishes since the transition of urban life. These can be either open or closed spaces. Space, with the simplest definition, is place of a person or group. Space is a place which has human, human relations, and equipment required for these relations and the boundaries of a space is defined according to the structure and characteristics of activity (Gür, 1996). Urban is a settlement consists of these spaces and people using them.

While Norberg Schulz defines the urban as a "meeting place" in which people come together and a "microcosm" surrounding the people (Erdönmez and Akı, 2005), Lynch (1960) defines the urban as a place of a communication in which there are open and closed symbols, religious symbols, signs and plates, towers, columns, entries and rural areas. Urban have a different user segments together with the diversity of this place. So, all of the city's open

spaces especially in public spaces are used by different age groups. Children are one of the most important of these user groups.

Churchman (2003) began his research with a question "Is there a place for children in the city?". In fact, we should ask this question for all cities and even all the settlements where children are in. Because unfortunately open green spaces decreases in parallel with an increase in the population and the number of structural elements such as residential and business centers increases in urban areas with the process of urbanization. Decrease in open areas also causes a decrease in outside play areas for children. Whereas as mentioned in the previous sections playing in open spaces is really important and necessary for the healthy development of the children.

Being Child in the City

Nowadays childhood has shown a change through over-controlled by families rather than child-centered (Francis and Lorenzo, 2008). Especially changing environmental conditions in urban areas-traffic density, lack of security- have significant impact on this change. As a result of this, while children spend less time in open areas, they spend more time with individual plays in their homes, in virtual environments such as computers and television and with technological devices such as mobile phone, portable play station, play station (Heerwagen and Orians, 2002; Onur, 2007; Acar, 2009). Eventually, problematic children who cannot interact with nature and with their peers, cannot develop talents and creativity and have limited knowledge about their environment are brought up. This also means problematic adults (Francis and Lorenzo, 2008). Whereas former children were playing in the gardens of their houses or in vacant fields near their homes, on the streets or special places they created. They could find opportunity to be with the same or different age groups and friends in there. Today this condition disappeared in urban areas although it continues in rural areas. This case is not special only for Turkey but for the world-wide (Francis and Lorenzo, 2008; Acar, 2009).

Especially in the last four decades of childhood both negative and positive changes have been occurred. The most alarming cause of these changes is developed cities. Children are increasingly disappearing in density and the chaos of the cities. They are often under the control of the adults while using open spaces. Researchers refer that this situation prevents the needs and the rights of living and enjoying the city of children (Francis and Lorenzo, 2008). Therefore, it is very important to find solutions that will allow children to use open spaces freely and happily for their needs in advanced and crowded cities. Because kids are the same everywhere and need opportunities for healthy development. According to Ellen Ruppel Shell (2001) the title of her article "Kids don't need equipment, they need opportunity".

There are open spaces that have different qualities in the urban centers. These areas provide opportunities for children and are grouped under the following headings;

- Private residential gardens
- Schools' and daycare centers' open spaces

- Shopping centers'-plazas' open spaces and courtyards
- Play areas in urban parks
- Playgrounds
- Streets
- Urban forests
- Vacant fields and natural areas
- Cities

Some of these open areas used by children designed especially for children, some of them are not designed (such as natural areas, streets). Needs of each designed areas can show diversity according to the state of the user and usage. While designing these places, designers should pay attention to these needs and children's desires. There are studies on the design of these open spaces in the literature (Moore et al., 1997; Francis, 1998; Spencer and Woolley, 2000). Generally issue of "how urban open spaces should be designed for children" will be discussed under the next heading.

How cities should be for the children?

Issues such as how cities should be for children, design criteria for urban open spaces designed for children, and specific points need to be considered in design are classified under specific headings by experts who design open space for children and work on these issues.

Elizabeth Jones (1997), classified specific design elements of spaces under the 9 titles including children play activities depending on the design requirements. These are:

1. Accessible-Inaccessible
2. Active-Passive
3. Challenge/Risk-Repetition/Security
4. Hard-Soft
5. Natural-People/Built
6. Open-Closed
7. Permanence-Change
8. Private-Public
9. Simple-Complex

"They all are essential in the creation of outdoor settings offering guidance in meeting the needs of children intellectually, socially, cognitively and physically" (Jones, 1997).

Owen (1988) determined the qualities required for children in urban design in accordance with the relevant experts and children's statements to define best cities. Francis and Lorenzo (2008) also determined characteristics of better urban places for children based on their design experiences and Owen's (1988) suggestions. These characteristics are;

1. *Accessibility*: Play areas (if far away from children's home), especially for small children, should be separated from traffic flow, and be connected to their home or school with a good link or be within reach by bike.

2. *Mixed use and mixed users:* Children do not like mono-functional zoning. These ideas are consistent with the mixed use and zoning idea of urban designers and planners today. Children want to be together with individuals with different age groups and cultures rather than special places for themselves. They want to try events and functions, and make observations without limitation of adults in a space.
3. *Sociability:* Children want to be together with different age groups of children and young people autonomously. Besides, children and youth want to be involved in management of some places.
4. *Small, feasible, flexible:* Children often prefer small-scale constructions formed by recycled, low-cost materials, and natural and green components.
5. *Natural, environmentally healthy, growing and in movement:* Natural elements, especially plants are preferred by children and are responded to their expectations as they are living materials and reflect seasonal changes. Natural elements, therefore, used for different activities by children and should be included in the design of children places. In addition, other living materials and water should be considered.
6. *Urban and place identity:* Disorder in scale, function and form in children's place, especially in urban areas, cause perception of space, as a market place. Whereas children know that places need to be identifiable. Signals and signs can be designed into the physical plan. Their design solutions are colors, materials, plantings, etc.
7. *Places and opportunities for participation:* Children want to contribute to the ongoing, flexible, and permanent design in the process. Children feel good about themselves and have protective attitudes when they have a voice and contribute to the design of the environment they live in.

Tai et al. (2006) classified the design process in a play area under the titles such as research (the inventory and analysis, program development and user needs, design) and construction documentation (cost estimating, implementation). Considerations for determining user needs in this process are listed as follows;

- *Five senses:* Designs to outdoor areas used by children should contribute to the use and are aware of their feelings. Scientifically, unchanging and unchangeable environments is not ideal for the senses. When diversity is not exist in the environment, the brain searches for other ways to stimulate such as self-introspection or goes to sleep, concentration deteriorates, attention fluctuates and lapses. In contrast, varying stimuli provides attention and awareness keeps you awake (Day and Midbjer, 2007).
- *Scale:* While adults see the world on a larger scale, children are more cautious about the details. Studies in this area also support this idea. Gary Nabha, one of the authors of *The Geography of Childhood*, saw his photographs are different, looking at the photos taken by his son in western National parks travels. While his photographs present interesting vistas, his son took more photos with rocks, twigs, lizards and other more tactile, small-scale objects. Therefore, when an adult designs a space for children, he should care for the child's point of view.
- *Safety:* Creating a play space, safety is one of the most important design principles to be considered. At this point, there are two important elements that children like to see

around; the water and the high elements. Therefore they should be used in children places by taking the necessary safety precautions.

- *Retreat:* Although children are different from adults, it should be noted that they are also individuals and there are similarities between adult and kids. Adults need special places that they will be alone for relaxing and escaping. Children need spaces away from the control of adult, feeling secure and playing privately. These spaces should be in a safe environment and close to adults so the security of children should be guaranteed. Such areas can be form in bounded tree house or a building, such as plastic game tubes.
- *Play:* Play is an activity that is important to explore the world through the eyes of a child. There are many theories and classifications for play. One of them is contributing to the child's physical development and active movement. Another one is contributing to the development of the child's mind and the discovery of creative environment.
- *Active play:* Active play, in essence, includes a lot of action. These are extremely important for the development of physical health and motor skills. However, it should be noted that children having different needs have different expectations. This situation is related to different skill levels and preferences of the children. In this case, play spaces should be funny and comfortable for physical and active play. These places should also be versatile for the different needs and abilities of children.
- *Creative play:* Creative play is one of the most important experiences in the childhood period. Children's creativity develops when stimulated in a healthy play environment. The natural environments are the best areas to stimulate creativity and to encourage children. In such areas, twigs, leaves, rocks, provide opportunities for different play. When a child is given any material to create a new world, possibilities are endless.
- *Plants:* The selection of plant materials in the play area requires care. Dangerous, poisonous, thorny, and allergic species should not be used.
- *Wildlife:* Plants, necessary for play areas, is also important for wildlife. Monitoring these habitats is necessary for childhood learning.
- *Food:* While plants provide habitat for wildlife, they also provide information about ecology for children with the features such as acorns, nuts, berries, or other seeds.
- *Water:* All animals need water to drink or bathe. A water feature in the garden guarantees that birds will come into this area in the future. In this way, children can be ensured to see birds.
- *Shelter:* To attract wildlife and keep them in the area, shelters, especially on plants, can be made for animals. Brush piles, fallen logs, rock piles and other natural elements can provide animals safety and shelter.
- *Place to rise the young:* Wildlife has benefits both for adults and children. Children can learn about wildlife by observing the natural environments.

There are different elements around that we can use to draw children's attention. These elements should be utilized in the designed areas for children. Water is one of these elements. Water, either artificially created or with natural surroundings (a river, lake or sea), in the city are always offers unlimited opportunities for children to explore (figure 11). Similarly, blankets, pillows and boxes can be used to create places to hide. Trikes and bikes

encourage children to be active. All of these and other similar elements can contribute to the development of children's physical ability, motion, coordination, balance and testing skill, and encourages them to play. The setting that include "attractive materials" can be a clue when designing play spaces for kids (Jones, 1997).

As a part of biological diversity, plants, animals, water elements (lake, river, ...) that provide habitat for a particular species, and natural areas that include a portion or all of them in urban areas, can be a source of inspiration for play (Acar, 2010) (figure 12). Even if not completely natural, these should be used in the design of children spaces. As discussed in detail in the previous sections, contact with natural areas and natural elements in childhood is extremely important for children. As Robin Moore pointed out, "green" alone is not enough as well as. Spaces created for children should be child-centered, recollective and inviting, and should continuously be effective on the development of children (Tai et al., 2006).



Luxemburg, Luxemburg



Canakkale, Turkey



Tokyo, Japan



Tokyo, Japan

Figure 11. Playing with water have always been attractive and exciting for children (Photos Acar, H.)

Gender differences should be taken into account in play space design. Girls and boys are different from each other physically, and activity elements should be suitable for both sexes. Although the reason is not always clear, girls and boys are attracted to different places. Boys' plays can often last over days even weeks to complete. While boys usually construct unused buildings (especially tower), the girls usually construct rooms with people in them.

Girls are often pay attention to the aesthetics of the environment and like colorful and beautiful flowers. Girls particularly 13-15 aged ones, have a variety of definition about the space when compared to boys (Day and Midbjer, 2007). It is observed, that girls prefer, for example, flowers and butterflies and trees, whereas boys prefer more active play such as sliding and playing hide and seek. However, they all need quite places to rest, talk, and socialize (Simonic et al., 2005).



Figure 12. Figure 12. The opportunity of interaction with animals allows children to have information about the animals (Photo Acar, H., Nara, Japan)

Color is an important factor in the children's preferences. Color preferences are personal. Young children love bright colors. In the 1960s, some educationalists were considering that children can only perceive main colors. Today, it is believed that they are over-stimulating. Strong colors can be used in small spaces. But, in large spaces in which we spend more time, it would be better to use muted colors or mood stabilizers. Distinct and warm colors (red, yellow, and orange) are preferred by children over 6 years old. This is not surprising. At this age, they are activity-led, not feeling- or thought-led. Boys preferred red color more than girls that is compatible with their behavior. Older children prefer blue color. Beyond the personal preferences, there are also powerful therapeutic effects of the color (Day and Midbjer, 2007). The color choice seems to change according to age. H. Friedling, in his study performed in 1974, showed the color preferences of children according to age. According to this study, popular and unpopular colors vary as follows (Gür and Zorlu, 2002):

- Popular colors:
 - 5-8 ages – pinkish purple, red, pink, lilac, lemon yellow
 - 9-10 ages – purples, pink, red, turquoise, reddish orange, coffee,
 - 11-12 ages – green, light blue, red, purple
 - 13-14 ages – light blue (masculine), red (feminine), blue, green, orange, dark orange

- Unpopular colors:
 - 5-8 ages – black, white, gray, dark brown
 - 9-10 ages – gray, dark brown, black, rust green, rust blue
 - 11-12 ages – olive green, rust green, purple, lilac
 - 13-14 ages – rust green, brown, dark brown

Children would like to see plants that can be used for play. For this purpose, plants can also be used to serve a variety of outdoor activities in open spaces designed for children. Trees, shrubs, flowers, vegetables and parts of these plants, such as branches, leaves, pinecones are important elements of children's environments and plays (figure 13, 14, 15). Plants in child environments are used with the objectives of enclosure, identity, movement, climbing, play props, programmed activities/education, accessibility/integration, landmarks, seasonal change, wildlife enhancement, climate modification, and environmental quality (Moore, 2002). Plants offer different color options in different seasons with their colorful leaves, flowers and fruits. Results of the author's master thesis that focused on the plant preferences for children play spaces revealed that children like red, yellow, mottled, blue and orange colored leaves while they do not like yellow and green colored leaves. Study also revealed that purple, pink and white flowers were favorite, while red and white colors were unfavourable. In terms of fruit color, study also found that red and blue were favorite, while yellow and orange colors were unfavourable (Acar, 2003).



Figure 13. Plants are interesting materials for children (Photo Acar, H., Paris, France)

The functional properties of the plants can be assessed by children in addition to the esthetic properties such as color, form, etc. As mentioned in previous sections, to evaluate existing elements, such as the functional point of view is more important for children. In this respect, children use plants in the playground depending on the features that they have for activities such as climbing, hiding, symbolic games (branch and leaf-like parts of the imaginary cone), and swinging (Acar, 2009). For these purposes, appropriate species selection is needed depending on, function and usage of the space, and the activities that will take place (e.g. size, form, texture, evergreen-deciduous, coniferous-broadleaved, fruit-fruitless, etc.)

(Moore, 2002). In addition, care must be taken for children's health and safety according to selected species (allergens, toxic, barbed should not be used).



Figure 14. Figure 14. Plants are ideal materials to hide behind (Photo Acar, H., Trabzon, Turkey)



Figure 15. Figure 15. Plant parts are important play materials (Photo Acar, H., Trabzon, Turkey)

Finally, White and Stoecklin (1998), cited the following features that children likes to see in public areas;

- water
- vegetation including trees, bushes, flowers and the long grass
- animals, creatures living in ponds
- sand and water
- natural colors, diversity and change
- places to sit under, in, and on, and sheltered places
- hidden, and private, places and places providing good view
- especially replaceable structures, materials, and equipment that they imagine

These features and everything mentioned so far are important clues for the design of open space for the children. Needs and preferences can vary depending on the individual; however, the knowledge of the general trend provides a significant contribution for space design.

Children's participation in the design process

Overall, by definition, "participation" refers to that the active participation in decisions affecting one's self and has a say. This is also the right of individual citizens in a democracy. A meaningful participation in the design of open space can be achieved by the participation of individuals from all ages on the subject that includes designed field evaluation, identification of problems, evaluation of the available data, solution proposals, needs and the development of alternatives and by combining all of these on a common plan for a conclusion. Participation is local, transparent, inclusive, interactive, responsive, relevant, educational, reflective, transformative, sustainable, personal and voluntary (Driskell, 2002).

Children should be included in the design of kid play areas through the design process, if possible. Children participation in the decision-making process has advantages for both designers and practitioners. In this way, their needs will be met and their contribution to the construction process leads to a protective attitudes towards these areas among them. "Local Agenda 21" action plan that was introduced in the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 and accepted by the UN members, strongly supports the involvement of children in the planning of local environments.

A meeting was held in Bologna (Italy) in May 1994 to contribute the identification of child-friendly cities. Approximately more than 300 children from 100 primary and secondary schools in different cities of Italy, educators, planners, and administrations all have described the problems of the cities. All of the children supported by WWF Italy took part in participatory design projects. As a result of these activities, *The Children's Manifesto: How to Win Back Our Cities* gives clues for future urban design. According to this, the children's ideas are grouped under following headings: "needs in general, expectations from the city, needs regarding urban green spaces, needs in school, needs related to whelming traffic, and needs for the future" (Francis and Lorenzo, 2002). Some of their expectations are;

- to interact with nature in cities which means: playing, climbing, building huts, listening, looking and understanding,
- to have different experiences, sleeping out of doors, strolling together, 'kites between the houses', bridges between the windows, etc.
- more sport activities and children's theaters,
- areas for cycling
- to be heard by others
- to establish children's council to participate decision-making
- quiet environments

- colourful and beautiful schools
- secure traffic
- a lot of trees, shrubs and grasses,
- collect fruit trees

These are very important as it reflects the expectations of children's requests.

Francis and Lorenzo (2002) stated that children should be included into the process of urban design. In this context, they identified seven realms for children's participation in urban design and planning.

1. Romantic
2. Advocacy
3. Needs
4. Learning
5. Rights
6. Institutionalization
7. Proactive

A new approach is on the agenda in line with the participatory design to re-planning of cities which are not suitable for children to meet their needs. This approach is a proactive process that is including idea of children, adults and professional designers. This approach is fundamentally different approach to the participation of children, which indicates multi-faceted perspective and multi-faceted participation. It is based on listening and learning the ideas of children, adults, designers, planners and decision-makers. Differences of opinion between children and adults are negotiated. In the design process, the concepts of equality, justice, and sustainability are important. This process is also based on social science methods that adults re-remember their childhood experiences and share them as their own children. In addition, this involves the use of Internet and Digital Media interactively. This approach claims that the work of children in other age groups, will contribute to the formation of livable, ecologically sustainable and child-and adult friendly cities (Francis and Lorenzo, 2008). In this process, children can participate to the design of children's play areas.

5. Examples from the world

In order to make an overall assessment of selected samples around the world, it is important to see the different perspectives and approaches for the design of children's play. It is possible to increase the number of samples.

Rotterdam, Netherland

This example is a play space in which space's boundaries are defined with color differences on the ground in the city. This area is composed of artificial equipment completely and is quite small. Despite this, it allows more than one activities (figure 16).



Figure 16. Play space from Rotterdam, Netherland (Photos Acar, H.)

Brussels, Belgium

This area was designed in woodland in the city. It is particularly suitable for disabled people with ramp play equipment. It provides an opportunity to contact with nature for children as it is in a woodland area (figure 17).



Figure 17. Figure 17. Play space from Brussels, Belgium (Photos Acar, H.)

Luxemburg, Luxemburg

Ship is a play element that is frequently used in playgrounds and is also attractive in any time for children. It evokes discovery and adventure. The figure of the ship, located in the city offers many activities (sliding, hiding, stable standing, monitoring around, climbing, etc.) for children. Timber materials are used in the area and their colour are in a harmony with wooded area. Animal figures are used as sitting equipment. Although they are artificial, they give an opportunity to children to see and touch the turtle. Water-related spaces that children would like to see were designed in a wide range. In addition, there are towers offering different height options in this play spaces (figure 18).



Figure 18. Figure 18. Play space from Luxembourg, Luxembourg (Photos Acar, H.)

Den Haag, Netherland

There is also a ship figure in this play space. In addition, there are different equipment for different activities such as swinging, sliding, balancing, jumping, and playing with sand. Seating areas were also designed around the playground for parents together with the children (figure 19, 20).



Figure 19. Figure 19. Play space from Den Haag, Netherland (Photos Acar, H.)



Figure 20. Play space from Den Haag, Netherland (Photos Acar, H.)

Istanbul, Turkey

This example is in woodland of the city. There are only artificial equipment offering different activities in this play space. Because these play spaces located in a natural area, they provide the opportunity to become intimate with nature for children (figure 21).



Figure 21. Play space from Istanbul, Turkey (Photos Acar, H.)

Paris, France

This play area located in Paris is an extremely good example in terms of different topography options. The existing slope in this area was evaluated without too much intervention. As described in affordance theory, curved surfaces afford to climb or slid. So, there is more climbing activity provided with different equipment such as rope in this play area. In addition, this play space is suitable for sliding. Also, although this is a fairly curved area, the safety of children is provided by safety barriers. Boundary elements are also suitable to sit (figure 22, 23).

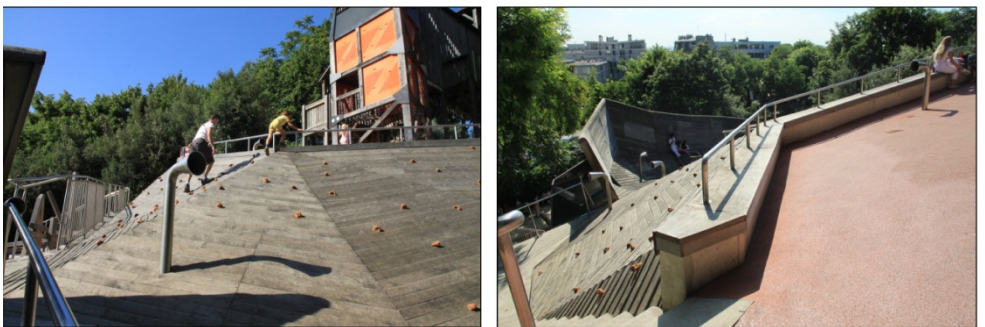


Figure 22. Play space from Paris, France (Photos Acar, H.)



Figure 23. Play space from Paris, France (Photos Acar, H.)

6. Conclusion

As a result, looking at the subject in the light of information covered so far in general, the design process in outdoor play space for children in urban areas can be classified under the following headings.

- Site analysis and data collection
- To form main design decisions in accordance with the field opportunities and the needs and preferences of children
- Producing scenario
- Selection of ideal scenarios and detailing
- Application

In this process, the design considerations of play spaces in urban areas can be grouped under the following headings.

The nature of the site and facilities:

Designed area: The location of designed area in the city, the relationship of space with its surroundings and the possible means of transportation and routes of people expected to use this area should be determined.

The usage status: The place that will be designed as play space or its surroundings and the purpose of use should be evaluated. For example, the school, city park, playground, and so on. Accordingly, the users (age group), as well as the needs and demands of these users should be determined. For example, if the designed area is a primary school, intensive use depending on the number of students at certain intervals such as break hours; areas of application that can be made for courses such as science or nature experiences; areas for active movement such as physical education courses should be considered.

Site facilities: The whole data during the site analysis and information gathering about field (topography, climate, existing vegetation types, soil, space and constructions around the pedestrian-vehicle transport) should be reviewed and evaluated. The positive ones (plant species evaluated in case of the protection, different topography options) should be evaluated in the designs by maintaining or strengthening. In this way, the area will be completely unmodified and untreated, so the existing facilities will be evaluated. The negative features (bad images, features that constitute a threat to children) should be removed from the area or improved.

The needs of children:

User profile: The user group of the area is extremely important. Because when the development, changes in physical measurements, sense and mental capacities and motion abilities of children according to their age is considered, the change of needs and desires is inevitable. Therefore, the varieties of activity and capacities of spaces should be determined appropriately for the age groups of children that will use these areas.

Expectations: The preferences of people vary according their personal expectations, environments and cultures. This situation is also same for children. However, the needs and desires of children about open spaces have been shown by some investigations. It is possible to determine on the basis of their general tendency. It will give useful results if some interviews are made with the users of the area to determine their direct expectations and even by including the children to the designing process. In this way, children's expectations will be fulfilled by mutual consultations. In this way, designed play spaces can be used by children for a long time. Apart from this, if there will be a revision to the design area, giving design decisions would be more healthy after observing the behaviors of children using the area for a while before design it from the beginning.

Activities: Before you design an environment, you need to determine the activities which are expected to be implemented in that area. Because, spaces are designed depending on the particular activities. When designing the space for the child, users' requests, the age groups of children are kept in mind to decide which activities would be done. These activities may be active or passive. The form, capacity and equipment of space are designed according to the type of determined activity and number of people performing this activity. Suggested activities for children in outdoor areas should contribute to their physical, mental, emotional and social developments. In addition, it is essential to suggest some areas for the parents to sit and rest since they need to be near their children.

Safety: Safety is one of the most important issues in children's play spaces. If a field is not safe, no matter how many different activities it suggests, the children will not favour them. Or their families will not allow their children to use that space. Security in play areas should be ensured in terms of accessories used in the play space as well as its relationships with its environment.

Nature: As it is mentioned the contribution of natural areas and materials for to the development of children are extremely high. For this reason, the natural elements designed children's play spaces must be provided transportation. Therefore in designs, natural materials such as plant, rock, and water should be used so that they allow for children to use the appropriate size in playing.

Plant: Plants and parts such as branches, leaves, and pinecones are very good play materials for children. They are preferred especially when children can use them with different aims due to their creativity during their plays if they are open to be changed. For this reason, they contribute to children's intellectual development and the development of their power of creativity. In addition, the use of nature enables the children to learn the natural cycle since they are alive seasonal changes, leafing, flowering and fructification time. However to manage this it is necessary to ensure the appropriate planting for play area. For example, for climbing activity, species that has branching structure which are not so high and are appropriate for climbing should be selected. To show seasonal variations, species showing coloration in autumn and having leaved broad can be selected. Species with edible fruits may be included where appropriate. For the development of children's visual senses, leaves, wind, sound-producing species should be suggested. These examples can be multiplied. If the existing plant species in the area will be used for these purposes, they should be protected. In addition, those which have psychologically negative affect or which are harmful for children with, such as barbed or very tall species should be avoided.

Water: Water which always attracts the attention of children is a very important material. It should be used necessarily in play areas. It can be used such as a fountain, water gushing from the ground, pied feet of small puddles of water, with sand in different forms.

Animal: Animals always attract the attention of children because of they are living organisms and acting. Children tend to touch or examine a small ant whenever they see them. Seeing animals around themselves will be affective to understand and have information on their roles in the life cycle, their nutrition their habitats. Zoos are open areas offering children a chance to see animals in nearly natural environments. However, arrangements can be made in smaller areas to provide the opportunity to see animals which do not need special care such as ant, bird, butterfly. For example, to manage this, plant species which attract birds and butterflies can be used.

Topography: Topography of the area can be used for different activities. For example, curved surfaces enable children to climb and slide, high places do the same for going on around the watch, the hills are good for rolling over and hiding behind. If these and similar topography options are present in field, they should be established or improved in the different options. Because children prefer very irregular forms than a uniform backgrounds.

Socialization: Open spaces allow children to be associated with ones at the same or different ages. It is important for the socialization of children. Therefore, you need to design areas to ensure children to have time together with other children. These places may include activities that meet large groups of people, and activities in large areas. Moreover, there should be relatively small-scale spaces allowing two children to sit and chat in more quiet corners of the field, either.

The use of the senses: The play spaces should contribute to the development of the senses of children. Therefore, designs and accessories that we can collect data from environment by five senses in the play should be used. For example, plant species with fragrant flowers to smell, different sound-producing musical instruments to hear, different display mirrors offering a choice of perceive to see by looking at the outside environment, edible plant species to taste, different textured surfaces or plants created by offering a choice of vertical and horizontal planes or different textures to touch should be used.

Creativity: Outdoor play areas contribute to the development of children's creativity. However, for this, environment elements can be modified and used for different purposes. These can be different materials such as water with sand, or non-constant materials to build a structure in the field, flowers and leaves to make a symbolic meal in children's plays, the boat leaves to refloat, the plant parts to ride a horse and so on. Children use them in playing in accordance with their creativity and imagination.

The materials that is to be used:

Safety: Security is the most important criteria in playgrounds design. For this reason, safety should come first both for the designed play areas, its surroundings and the material; we should avoid the life-threatening risks for children.

Soundness: All the materials to be used in play space should be sound, convenient and ergonomic in terms of anthropometric measurements of children. For more use, the deformed space and accessories should be renewed or replaced as soon as possible. Wooden materials that will be used should not be cracked or rough.

Health: Plant material that will be used in the play space should not be constituted a threat to the health of children. To do this, toxic, allergenic pollen, with thorny species should be avoided. In addition, horizontal, vertical, or other artificial materials used in contact with reinforcement made of materials should be non-toxic.

Natural-Artificial: Based on the studies on the subject, most of them appear to prefer natural areas or natural materials. And this material provides a positive contribution to their development. However, this does not indicate the need for children's play spaces using only natural materials. Because, artificial materials with color, texture and potential in different sizes attract children. For this reason, natural materials, as well as artificial materials should be included in the designs.

Free materials: In play areas, there should be portable free standing, unstable materials that allow children to change their places and take them together to build new things. These

enable children to build up the objects in their dreams and to learn while doing and trying so and to be in cooperation with other children also.

Design for Everyone: The right of every citizen is to take advantages of urban open spaces equally. Therefore, in the play places designed for children in cities all children (disabled, non-disabled) should take advantage of them. Therefore, non-impaired persons with disabilities at the beginning of the design process needs to be considered. Both efficacy and regulations (space and reinforcement measures) should be considered.

As a result this article deals with children's play areas' design in urban open space. It should not be forgotten that children's preferences and expectations may vary according to the individual, the society and the culture. However, scientific studies on children, children's environment and children's preferences, observations and experiences show us that the general trend is in this direction. In addition, all the types referred to in a play space, variety of activity areas or equipment may not be able to use together. In particular concept (such as water gardens, water gardens or sense) of one or a few of them in the play area may be considered. In addition, the above mentioned information is considered to be an important resource for those working with children and general open space designer for children.

Finally, "a child's play space should ideally never be finished, it should be in a constant state of change" (Goltsman, in Loughlin and Suina, 1997).

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7. References

- Acar, H., 2003. A study on determining plant preferences of users in children playgrounds: An example of Trabzon city, (In Turkish: Çocuk oyun alanlarında kullanıcıların bitki tercihlerinin belirlenmesi üzerine bir araştırma: Trabzon kenti örneği), Master Thesis, Karadeniz Technical University, The Graduate School of Natural and Applied Sciences, Department of Landscape Architecture, Trabzon, Turkey.
- Acar, H., 2009. Assessment of natural landscape elements' play affordances, (In Turkish: Doğal peyzaj elemanlarının oyun olanaklıklarının değerlendirilmesi), PhD Thesis, Karadeniz Technical University, The Graduate School of Natural and Applied Sciences, Department of Landscape Architecture, Trabzon, Turkey.
- Acar, H., 2010. Contribution of urban biodiversity to children's play, Proceeding of the 2nd International Conference of Urban Biodiversity and Design, p. 323, Nagoya, Japan, 18-22 May, 2010.

- Bell, S., 2008. Scale in children's experience with the environment, (in: *Children and Their Environments*, Edited by Christopher Spencer and Mark Blades), Cambridge University Press, New York, 13-25.
- Bixler, R. D., Floyd, M. F., Hammitt, W. E., 2002. Environmental socialization: Quantitative tests of the childhood play hypothesis, *Environment and Behavior*, 34, 6, 795-818.
- Churchman, A., 2003. Is there a place for children in the city?, *Journal of Urban Design*, 8, 2, 99-111.
- Clark, C., Uzzell D.L., 2008. The socio-environmental affordances of adolescent's environments, (in: *Children and Their Environments*, Edited by Christopher Spencer and Mark Blades), Cambridge University Press, New York, 176-195.
- Clements, R.L., Fiorentino, L., 2004. *The child's right to play*, Greenwood Publishing Group, USA.
- Day, C., Midbjer, A., 2007. *Environment and children: Passive lessons from the everyday environment*, Architectural Press, Oxford.
- Derr, T., 2008. 'Sometimes birds sound like fish': Perspectives on children's place experiences, (in: *Children and Their Environments*, Edited by Christopher Spencer and Mark Blades), Cambridge University Press, New York, 108-123.
- Driskell, D., 2002. *Creating better cities with children and youth: A manual for participation*, UNESCO and Earthscan Publications Ltd., UK.
- Erdönmez, M.E., Akı, A., 2005. Açık kamusal kent mekanlarının toplum ilişkilerindeki etkileri, *YTÜ Mimarlık Fakültesi e-Dergisi*, Cilt 1, Sayı 1.
- Fjørtoft, I. ve Sageie, J., 2000. The natural environment as a playground for children landscape description and analyses of a natural playscape, *Landscape and Urban Planning*, 48, 83-97.
- Fjørtoft, I., 2004. Landscape as a playscape: The effects of natural environments on children's play and motor development, *Children, Youth and Environments*, 14, 2, 21-44.
- Francis, C., 1997. Particular places: School environments over time, (in: *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*, Edited by Sharon Stine), John Wiley&Sons, Inc., New York, 45-87.
- Francis, C., 1998. Child care outdoor spaces, (in: *People Places: Design Guidelines for Urban Open Space*, Second Edition, Edited by Clare Cooper Marcus and Carolyn Francis) John Wiley&Sons, New York, 259-310.
- Francis, M., Lorenzo, R., 2002. Seven realms of children's participation, *Journal of Environmental Psychology*, 22, 157-169.
- Francis, M., 1997. The players, (in: *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*, Edited by Sharon Stine), John Wiley&Sons, Inc., New York, 1-11.
- Gür, Ş., Ö., Zorlu, T., 2002. *Çocuk mekanları*, 1. Baskı, Mas Matbaacılık, YEM Yayın-75, İstanbul, Turkey.
- Gür, Ş.Ö., 1996. *Mekan örgütlenmesi*, Kare Reklam, Ankara, Turkey.
- Heerwagen, J., H., Orians, G., H., 2002. The ecological world of children, (in: *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*, Edited by Peter H. Kahn, Jr. and Stephen R. Kellert), The MIT Press, London, 29-63.

- Heft, H., 1988. Affordances of children's environments: A functional approach to environmental description, *Children's Environments Quarterly*, 5, 3, 29-37.
- Jones, E., 1997. Basics, (in: *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*, Edited by Sharon Stine), John Wiley&Sons, Inc., New York, 13-43
- Katcher, A., 2002. Animals in therapeutic education: Guides into the luminal state, (in: *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*, Edited by Peter H. Kahn, Jr. and Stephen R. Kellert), The MIT Press, London, 179-198.
- Kellert, S., R., 2002. Experiencing nature: Affective, cognitive, and evaluative development in children, (in: *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*, Edited by Peter H. Kahn, Jr. and Stephen R. Kellert), The MIT Press, London, 117-151.
- Kyttä, 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, 109-123.
- Kyttä, M., 2003. Children in outdoor contexts: Affordances and independent mobility in the assessment of environmental child friendliness, Doctor of Philosophy, Helsinki University of Tehcnology Centre for Urban Regional Studies, Espoo.
- Kyttä, 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, 179-198.
- Loebach, J., 2004. Designing learning environments for children: An affordance-based approach to providing developmentally appropriate settings, Master of Environmental Design Studies, Dalhousie University, Halifax, Nova Scotia.
- Louighan, C., Suina, J., 1997. Congruence, (in: *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*, Edited by Sharon Stine), John Wiley&Sons, Inc., New York, 89-135.
- Louv, R., 2008. Last child in the woods: Saving our children from nature-deficit disorder, Algonquin Books, USA.
- Lyle, J., 1997. Ode to the outdoors, (in: *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*, Edited by Sharon Stine), John Wiley&Sons, Inc., New York, 187-229.
- Lynch, K., 1960. The image of the city, Mit Press, Cambridge.
- Memlük, M.Z., 2012. Urban landscape design, (in: *Landscape Planning*, Edited by Murat Özyavuz) InTech, Croatia, 277-298.
- Moore, R. C., 2002. Plants for play: A plant selection guide for children's outdoor environments, MIG Communications, Berkeley, California.
- Moore, R. C., 1991. Streets as playgrounds, (in: *Public Streets for Public Use*, Edited by Anne Vernez Moudan with a foreword by Donald Appleyard,) Columbia University Press, New York, 45-62.
- Moore, R. C., Goltsman S.M., Iacofano, D.S., 1997. Play for all guidelines: Planning, design and management of outdoor play settings for all children, Second Edition, MIG Communications, Berkeley, California.

- Motloch, J.L., 2000. Introduction to landscape design, Second Edition, John Wiley & Sons, USA.
- Onur, B., 2007. Çocuk, tarih ve toplum, 1. Baskı, Pelin Ofset, İmge Kitabevi, Ankara, Turkey.
- Özdemir, A., Yılmaz, O., 2008. Assessment of outdoor school environments and physical activity in Ankara's primary schools, *Journal of Environmental Psychology*, 28, 287-300.
- Piaget, J., Inhelder, B., 1971. The child's conception of space, Langdon, 4th Edition, Compton Printing Ltd., London.
- Proshansky, H. M., Ittelson, W., H. ve Rivlin, L., G., 1976. Environmental psychology: People and their physical settings, Second Edition, Holt, Rinehart and Winston, USA.
- Pyle, R. M., 2002. Eden in a vacant lot: Special places, species, and kids in the neighborhood of life, (in: Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations, Edited by Peter H. Kahn, Jr. and Stephen R. Kellert) The MIT Press, London, 305-327.
- Shell, E. R., 2001. "Kids don't need equipments, they need opportunities", Lifestyle Information Network, September/October, 34-35.
- Simonic, T., Gostincar, R., Recer, S., Luznik, J., 2005. Design initiatives for children play in urban environment, International Conference for Integrating Urban Knowledge & Practice Gothenburg, Sweden. May 29 – June 3.
- Spencer, C., Woolley, H., 2000. Children and the city: a summary of recent environmental psychology research, *Child: Care, Health and Development*, 26, 3, 181-197.
- Tai, L., Haque, M.T., McLellan, G.K., Knight, E.J., 2006. Designing outdoor environments for children: Landscaping, schoolyards, gardens, and playgrounds, McGraww-Hill Companies, USA.
- Taylor, A. F., Kuo, F.E., Is contact with nature for healthy child development? State of evidence, (in: Children and Their Environments, Edited by Christopher Spencer and Mark Blades), Cambridge University Press, New York, 124-140.
- VanDerZanden, A.M., Rodie S.N., 2008. Landscape design, Theory and application, Thomson Delmar Learning, Canada.
- Vicki, L., Stoecklin, M., 2004. Creating playgrounds kids love, <http://www.whitehutchinson.com/children/articles/playgrndkidslove.shtml>, 16.12.2004.
- White, R., Stoecklin, V., 1998. Children's outdoor play & learning environments: Returning to nature, *Early Childhood News Magazine*, March/April. <http://www.whitehutchinson.com/children/articles/outdoor.shtml>, 19.12.2012.
- Wilson, R., 2004. Why children play under the bushes, <http://www.earlychildhood.com/Articles/index.cfm?A=412&FuseAction=Article>, 16.12.2004.