

Child-oriented architecture from the perspective of environmental psychology

Maral Anbari¹, Hossein Soltanzadeh²

¹MS.c in Architecture, Centrak Tehran branch, Islamic Azad University, Tehran, Iran;

²Associate Professor, Centrak Tehran branch, Islamic Azad University, Tehran, Iran

Abstract

The present study is about child-oriented architecture from the perspective of environmental psychology. Due to the importance of the users of any architectural spaces and lack of attention of architects and being unfamiliar to psychological characteristics of specific users, such as children, it is needed to have proper perception of their understandings from spaces and their needs to architectural spaces specific to them and children's tendency to especial environmental graphic features such as: light, colour, and form should be studied and this research aimed at environmental psychologically-physically design in order to develop children emotionally and physically. The method used in this study was descriptive-analytical one and eventually by investigating children's plays and drawings their perceptions from the environment were achieved and their favorite colours and forms in terms of their age and sex were studied. At the end it was suggested in designing a place for children different factors such as creating various spaces based on the children's ages to release their energy, applying light and colours appropriate to children's emotions in inner and outer decoration, considering architectural criteria and standards for children and etc, should be regarded.

Keywords: architecture, child, psychology, space

Introduction

Today, in architecture and urbanization, physically design of spaces is not the only goal, but considering to all human aspects of spaces has a significant effect on designing that space. In today's architecture even improving urban structures such as highways, bridges, etc. are among the most important measures of any societies. Therefore, an imagery of the importance of human factor effect on the other constructions related directly to human being can be seen. Among them, spaces designed for children are more important than other spaces. As developing urban infrastructures to improve and develop cities towards correct and sustainable development, designing proper spaces for children lives who are the following generation in the community are important in directing human society towards an ideal and healthy community. Preparing and building places for children needs new thoughts and looks because children are more affected than adults from their surrounding environments. According to the experts in children's affair, social, emotional, psychological, and physical growth of children are highly affected by the environment quality.

Environment means city, neighborhood and streets, kindergartens, schools, open spaces and in general any places in which children spend the early ages of their childhood. Experts believed that architects should be careful enough for children design because the goal of designing specific environments for children, creating interesting spaces for them can grow their abilities and creativities not putting an end to their needs. Recognizing the psychological-physical characteristics of children to design an ideal environment for them is really important because without understanding children and their needs in terms of psychology, children growing stages and their emotional, social, and movement features in different ages, the designed environment can not be that much effective.

Defenitions and concepts

The psychology of the environment

The psychology of the environment has been come up since 1960s in 20th century. This field of psychology is about territorial behaviors, density and crowds and environmental stress makers. It is a branch with close relation to architecture, perspective architecture and urban design (Luc, et al, 2002). The psychology of the environment can be assumed as a scientific interdisciplinarity branch studing the mutual relationships between physical environment and human's behaviors. Considering the mutual relationship between the two elements (environment/ behavior) is derived from Winston Churchill's the popular speech expressing " we construc buildings and after the buildings we are built".

Child definition

Child is a mature and human's son or daughter who has not been fully grown and is an independant creature from individual features point of view put in the growth and development trend in which they have not reached to a level to be called matured but th y are originally and naturally dynamic and potentially to be developed.

The child's communication to the environment

Barker, founder of "echologic psychologist" belives there is a specific relationship between physical aspects of architecture and behavior of physical-behaviory stations which expresses them with the same concepts (Mortazavi, 1988), (Young, 1990). In all alive creatures and according to the law of affecting and to be affected in the environment, the tendency to compromise the environment is available, so that child tries to compromise with the environment in which they live. At first child tries to compromise the environment with their inner system and intelligence but since it is not possible for ever and child runs into problems and cases not appropriate with their previous experiences, they try to be in line with new experiences (Moghadam, 1987). According to Piyage, mental capabilities that a child owns in certain age, enable them to show different emotional behaviors. In fact there is a direct relationship between child's growth and learning. Piyage names four factors help child's mental growth as follow:

1. Emotional feelings which are motivations for learning;
2. Physical growth which child can gradually understand more;
3. Experiences which child learns to find out for themselves;
4. Social exchange or effective interaction with others especially parents, teachers, and playmates.

To teach children, work with them and even love them awarness and knowing their growth stages, emotional, psychological, and social needs in different ages is essential and by complete recognition of children's world and their needs, correct training in safe and rich environment appropriate with their needs can be obtained. Therefore, in this section it was tried to study children's psychological features from their drawings, the effect of colours on children and their application in designing spaces belong to them and the environment of children's lives in today's cities.

Objectivity and subjectivity in children architecture

Today, the most importan issue in architecture is the identity of architecture space and understanding it by users. To achieve this goal defining and re-introducing the environment and receiving its messages are needed. To do this there are different ways including experiencing the space by which objectivities can be achieved and compare them with primary thoughts and form them. Subjectivity is inner theories understood while objectivity is understandable phenomenons exist independently. In fact objectivity is available in dreams and has little effect on facts unless it is changed into a look through activating and predictable ways. On the pther hand, subjectivity is the

fact of every thing and dreams and fictions together can promote it. Most of the people perceive objectivity easily in architecture spaces and in two beds of experimental and geometrical spaces (Falamaki, 2002). According to Piyage, child can understand the environment with specific feature through passing developing and forming mental picture in relation to basic pictures. The most important features are:

1. Child's feeling perception to things is ambiguous and popular and is considered without any controls unless through a quick stimulus;
2. Child's feeling perception is slow because it depends on natural motivation and the rate of outer stimulus effect on them;
3. At first, child does not trust mental faces which means they use their past experiences less;
4. Child mixes fictions and facts, for example they believe they see something but do not lie;
5. Child's perception is at first highly limited to place and time and if effective on environmental and cultural factors in growing children (Shoarinejad, 1993).

Child's spatial perceptions

To put simply, child's spatial perceptions is how a child see the world and understand it. The purpose of recognizing the perceptions is to find a way to strengthen child's feeling perceptions and improve the quality of the space and environment to grow and develop the child. Child's spaces should be a creative one.

Exploring spatial relations

Piyage studied the exploration of spatial relations by children. He called this relations as "Spontaneous Geometry". An infant child has no certain perception from the spatial relations or different shapes first. Child along with their growth and connection with the environment and working gets familiar with different geometric things and simulates them. In categorizing geometry it is divided into three main categories: climatic geometry talking about shapes and angles; translucency geometry talking about perspective issues and finally topologic geometry talking about vicinity and integration concepts. Piyage through a simple experiment found that children develop geometric concepts in reverse chronological order of their discoveries (Mahdizadeh, 2006). He found that when children dominate the concepts of topologic geometry, they can understand the other concepts of geometry including translucency and climatic geometry. Children in younger ages have difficulties in distinguishing different perspectives of something which is called spatial self-centralization. Piyage accidentally found that this phenomenon is the first feature of child's spatial perspective. There is the concept of place is in time in child's imagination in younger ages as well.

Spatial ownership

The need to own a space in child is a fundamental need and is seen in all ages. The attractiveness of different spaces at home or school determined by various devices are by the fact that they are trying to possess them. Children of all ages are at home or school in an attempt to own a part of space. Each child asks their own rooms. At schools many children are unhappy for not having their own spaces. They prefer smaller and more intimate spaces. When the play area is diverse and full of signs and symptoms, it is easier to determine the scope for the child.

Child's senses and perceptions growth in the environment

In a child's room, all cases including lighting, temperature, color, safety and hygiene should be regulated and controlled. Thus creating a favorable environment in terms of health and environmental monitoring, is necessary. As mentioned, in general, most children make contact with the environment through the senses. In the first years of growing, two main tools of the child's cognitive change into visual and tactile senses. In these years changes in light and color and sounds features that child is constantly dealing with them, is very important and the diversity of audio visual

stimuli has been demonstrated (Mahdizadeh, 2006). A new space will be defined for the child by their growth and development. The space's play space is the most important and stable element in the child's development of creativity and imagination. It can be said that child learns the life experiences along with playing. In designing environments for children their needs should be considered carefully. For example, children have very different needs during the day and night. Space in which they spend at night should give them a sense of peace and security while space in which they spend in their daily lives should be full of variety and excitement and give them different skills. In all spaces designed for children, color and light play important roles. These two factors, if were well used, could bring them calm, friendly and at the same time dynamic and funny environment. In general, the most basic and important principle in designing a space for children, considering their needs and interests are prior to determined standards. The perfect environment could guarantee the child's growth efforts to provide a quiet, loving and healthy life for children.

Children's games and drawings

Children are directly experienced the space when trying to perceive them and even they try to symbolize the environment. These symbols and all the activities and actions of their behavior are aids to get the best possible situation. Children show the symbols in their games and drawings best, in other words, children's game is their efforts to touch and feel and control the world and become familiar with it (Behroozfar, 2001).

Objectivity and subjectivity in children architecture (childish games)

Given the importance of the games, the game space should meet child's needs in all areas of development, physical growth, cognitive, social and emotional fields. In a simple classification, child's needs and desires to variety of games can be classified in each age group:

Children ages 6-8: During this period, children have a strong desire to work full mobility and high physical activities which help to organize and develop their physical skills.

Children ages 6-8: In these ages they are classified into groups without supervision by approaching adolescence time and younger children tends to increase or show off their power and stability and physical harmony in a team and through holding sports matches. On one hand from the field of psychological perception games are classified into three categories and classes: training or skill games, symbolic games and regular games (Piyage, & Inhalder, 1992). Designers also classify children's games from the perspective of a variety of physical activities and needs and application environments in the following groups:

- a) Games with high physical activity such as jumping, running, cycling, crawl, climbing and glide;
- b) Innovative games such as playing with sand, plants, grass, water, sand and clay;
- c) Intuitive games, such as tactile, visual, sound and smell experiences;
- d) Games in solitude and silence: social gaming spaces should be separated from individual games.

Children's play space

Playing leads child to the growth of the social context of the child's personality. They should follow social issues and legal rules in group games. Various games have different effects on the child's emotional growth. In action games, children are developed learn self-development, self-satisfaction, self-esteem, acceptance of rules, sense of adventure, art, patience, awareness and self-control. Spontaneous games promote a sense of freedom, power, defense of individual rights, the ability to inhibit the growth of their aggression in children. structural games raise accuracy and stamina to children. That's why good design and good planning of playgrounds, creates children various possibilities for achieving various objectives (Piyage, & Inhalder, 1992). Game spaces like any other spaces designed for children, are better to have features as follow:

- Have soft surfaces;
- Are directly connected with bedrooms;
- Create the sense of happiness and excitement;
- Have amusing and soothing colours.

Childish drawings

Another category of children's symbolism and their mental imagery from the environment is formed in their drawings. children's painting takes shape. Drawing and doodling and basically any activities could represent a form of primitive art and one of the more creative play because it provides the ability to abstract perception and mental complex states. Children's drawings for his development in the diagnosis of recognizing objects and the distinction between them have two contradictory features: 1. Are weak to express some elements visible is not important for them. 2. bring elements that are important, but not visible (Ferrari, 1991).

Features of special spaces for children (tips on children architecture design)

Environment designed for children should include the following spaces:

1. Natural spaces such as trees and water and live creatures which form the most basic and important space for the children;
2. Open spaces and wide spaces in which children could run freely and release their internal energy.
3. Road spaces, roads before the presence of cars were children's main play ground. They are places in which children meet each other and a network which connects various spaces together;
4. Spaces for adventure, these spaces are filled with complexity that strengthen children's power of imagination due to being in this environment;
5. Play structure spaces are spaces designed with game structure and children's games and playing become important in them. The spaces are known as playground (Mahdizadeh, 2006).

Classifying the quality criteria for child-centered environment

Elements forming the space can be divided into the following categories, and finally to look at them from the perspective of a child:

- Organizing;
- Time and route;
- Part and the whole;
- Form;
- Coordination, scale and ...;
- Light;
- Colour;
- Signs.

The impact of environmental conditions(brightness)

Light is one of the architectural principles to provide visual comfort space that its psychological effects in humans are different. Researches have proven that natural and transparent light has positive impact on children's senses based on children's point of view these spaces are friendly and joyful.

1. Good and proper lighting in spaces causes increased Children's appetites;
2. Accuracy and concentration increase and eye health and vision ability are preserved and prevents nervous exhaustion.
3. Create variety and space emphasis. Since children's adoption to tolerate stress and exhaustion is less, sharp contrast from the lighting, whether artificial or natural, which causes fatigue

and stress should be avoided. As a result, soft light equitability about children's spaces seem desirable.

Environmental graphic specific to children

Understanding the psychological characteristics of children in different age groups, through the identification of line and color, space and form helps the designer to get familiar with their spirits, and try to communicate with this audience and to create space for them. In an environmental graphics, to create a visual communication with the audience, the graphic designer should be a messenger; targeted message towards introducing the environment. But the message and its applicability is one of the aspects of the case. Another aspects are the aesthetic aspects and efforts to make the environment beauty and ideal. Therefore, graphical form in addition to conveying a message to viewers presented with symbols and signs, can also influence the audiences in different format, and change the environment by decorating, and emotional, psychological and beauty aspects has changed and it will stay for the audience's heart.

The effect of colors on children and its application in designing their own spaces

From the aesthetics aspect, creating a favorable and attractive landscape spaces can prevent the anguish and depression in humans. In this regard, the use of paint and a nice painting and coordination as well as timely and measured contrast between the colors in public spaces are remarkable and creates a sense of peace and joy in the viewer. It is clear that these effects in children are more and more important. On the other hand, in psychological studies of children by analyzing their paintings, valuable conclusions regarding the use of color by the child, the link between flowers and children's imagination, the prospect of developing the use of color and symbolic aspects of any colors and combination of colors in the paintings of children, have been obtained (Shaterian, 2008). Although, the pleasure of watching a color is due to the nature of human aesthetics. But it rarely happens to react the color of a painting while standing next to them. Because the value of a art work is more in tune and deliberate contrast between the different colors used in it. This is similar to the phenomenon of music that combines different set of sounds, smooth or strident tone to be heard. The designers of spaces specific to children cannot be indifferent with valuable and important conclusions in recognizing colors and their impacts on children (Alaghbandrad, 2002).

The predominance of color and form

Most children under school age, the the ages between 3 to 6 years show strong interest to colors, but at the age of 7 to 9 years pay attention to forms, and this interest is maximized at age 9 years old. As the child grows up, the tendency to nature and form are increased. But in a survey, about 10 percent of pre elementary children have shown that they tend to dominate the form to the colors. Children who overcome a form more than the colors in terms of IQ are more clever than alleged color groups. But some theorists believe that ingenuity and creativity are more in alleged color groups. Studies on documents related to children in relation to the colors showed, the color orange, and then red and pink are favorite colors for children between the ages of 3 to 6 years old. According to Alshler, applying colors with awareness and knowledge of its relationship with the child's life excitement is concluded that red color is superior color for children and overallly for children act based on their emotions. As they become older and are able to control their feelings, they get interested in cold colors. Researches showed that red color has two contrasting features: first the feeling of affection and love, and the second induces a sense of attack and hatred because red colors are closely associated with very intense feelings. Blue is associated with emotional control. Researchers have found that children are also interested in brown. However, scientists have

discovered the fact that children who have a tendency towards blue, may have very severe emotions in some cases that modify it or change its direction (14).

Table 1: Psychology of colors and how to use them in spaces

| How to use it in spaces | Specifications | Color | No. |
|---|--|--------|-----|
| Using it in the environments of game, show and sport | warm color and stimulating Passion and love, sincerity | Red | 1 |
| For Educational spaces in elementary school – due to the prevention of drowsiness and lethargy in children ... lively, invigorating, warm peace of the children | Energizing and stimulating color | Orange | 2 |
| Its combination with other colors and use it in the space of rest | indicating Love and romance | Pink | 3 |
| It is better to use the color with combination with other colors in classes and educational spaces | Expresses the sense of relief - represents peace, security and order-expresses the feeling of sorrow, introspection and isolation in some people | Blue | 4 |
| To make interior decoration happy and bright | Warm and happy color- stimulating thought- making eyes bored more than other colors | Yellow | 5 |
| For decorating studying rooms, educational spaces and a place needs concentration. | Cool color and a symbol of nature - represents peace, happiness, health and jealousy, gaining the ability to read | Green | 6 |
| Pale violet spectrum in space and educational environment, gives peace and happiness. as a result it can be used practical and craft classes . | The most spiritual color represents harmony between reason and emotion and border between spirituality and materialism | Purple | 7 |

Table 2: Psychology of forms and how to use them in spaces

| The place of use | Excited emotions | Form | No. |
|-----------------------------------|----------------------------------|----------------------------|-----|
| Child's play space | Imaginery-creative imagination | Irregular forms | 1 |
| Entrance | Caller | Concave form | 2 |
| emphasis points and pausing space | Innovation and complexity | Static form | 3 |
| | Suggests the status of rejecting | Convex form | 4 |
| Children love the spaces | Softness and comfort | Soft and arched form | 5 |
| Passage | Comfort and mobility | horizontally Expanded form | 6 |
| | Hard | Angular and broken forms | 7 |

Researchers have found that there is a close relationship between selecting colors and genders; so that in the ages between 6 to 17 years old girls consider warm colors and boys consider cool colors but as the grow up this status get reversed. In terms of physical physiology, certain colors are considered to be associated with various diseases and as a sample table 1 can be considered and apply proper colors for any spaces regarding its psychological features and table 2 can be considered to apply suitable forms for children in designing spaces for them.

Conclusion

Unfortunately, due to neglecting the users in designing architectural spaces especially spaces for children, it is needed to pay attention to the children's psychological features and different stages of their growth as well as the stages of their psychological development and their perception of spaces to get closer to their childish world and their views to spaces and based on the children's psychological condition and specific age appropriate spaces to be designed and it is suggested to regard the following points in the following design:

1. Sex of the subjects;
2. Age of the subjects;
3. Creating spaces based on children's age and releasing energy;
4. Using light and colors appropriate to children in interior and exterior decoration;
5. Using bright and stimulating colors (for example, red, yellow, orange) in interior spaces that need a greater mobility and using softer colors (blue, green, Pink) in spaces that require mental focus and creativity;
6. Using architectural forms appropriate to children;
7. Using various open spaces that stimulate the sense of curiosity in children as well as releasing energy;
8. Considering the principles and standards of children architecture;
9. Using spaces that create the sense of belonging to a space;
10. Establishing spaces in which children feel secure and fearless.

References

- Alaghbandrad, J. (2002). Exposure to violence in adolescents, cognitive-behavioral factors and physical flexibility, *Journal of New Innovations in Cognitive Science*, 5, 2.
- Behroozfar, F. (2001). The basis of designing open spaces of residential areas in appropriate to children's physical and mental condition, *Building and Housing Research Center*, 339, Tehran.
- Falamaki, MM. (2002). The roots and architecture theoretical tendencies, Tehran: Scientific and cultural space institute publication.
- Farhang, E. (2004). Designing orphans' houses, M.A. thesis on architecture, Tehran.
- Ferrari, A. (1991). Children's drawings and their concepts (Trans: A. Sarafan), Tehran: Diba Publication.
- Luc, B., Luc L., & Dizel, J. (2002). *Social psychology*, translated by Ganji, H., Tehran: Tehran University Press.
- Mahdizadeh, M. (2006). A house for children, MA thesis on architecture, Tehran.
- Moghadam, B. (1987). *Application of psychology in school*, Tehran: Soroush Publications, Fourth Edition.
- Mortazavi, SH. (1988). *Environmental Psychology*, Tehran: Shahid Beheshti University Press.
- Piyage, J. & Inhalder, B. (1992). *Child Psychology* (Trans: Z. Tofigh), Tehran: Nashr e Nay Publication.
- Shaterian, R. (2008). *Architecture and design of educational spaces*, Tehran: Sima e Danesh Publication.
- Shoarinejad, AA. (1993). *Development Psychology* (Tenth Edition), Tehran.
- Young, J. (1990). *Justice and the Politics of Difference*, Princeton University Press.