

# STUDY ON OUTDOOR PLAYGROUND EQUIPMENT AND CHILDREN'S SOCIAL AND PHYSICAL DEVELOPMENT

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## ABSTRACT:

Twentieth century psychoanalytic thought emphasizes on children's need to play. From the viewpoints of expert children researchers, that children now have less time and opportunity to play than children of previous generations. This has affected the physical and social development of children. The distinct aspects of children's social and physical development were identified and their relevance to play equipment was studied. Investigative research focusing on user behavior was the key to gain understanding of how playground equipment is actually used by children. The observations showed that children seek new ways to use the equipment. Also it is found that the equipment does not provide for the development of some of the physical skills that children need. The specification of these gaps can help designers propose new concepts for outdoor play equipment.

Key words: Outdoors play, Social and Physical developments.

## 1. INTRODUCTION

The development of science and technology has transformed human life. These changes have happened in the life of children in ways that give them less time and opportunity to play than children of previous generations.

There is a growing body of research in addition to development twentieth century psychoanalytic thought about play's potential role in human development and evolution. Considering the importance of play in children's development and their future life, it is important to provide children with opportunities to play in good environments. The type, quality, and diversity of children's physical and social setting directly affect the type, quality and diversity of children's play. (Moore, Goltsman& Iacano 1992). Without a good range of play opportunities, children may lose the chance to develop their physical and social skills, emotional intelligence, independence, self-esteem and self-confidence. In this research outdoor playgrounds as one of the favorite places where children play has been studied to address these questions below:

1. How much does present playground equipment provide for children's developmental and personal needs?
2. What kinds of physical development needs do the play equipment provide for?
3. What kind of social development do children get involved in during play at an outdoor play setting?
4. What are the problems of present playground equipment as observed on the basis of the actual behavior of children?

## 2. BACKGROUND

Along with industrialization and urbanization, modern society is becoming increasingly more lawless, violent, undisciplined and permissive, and this trend is most apparent among the younger generation (Straughan,Roger1988). During the last few years,

there has been an explosion in the numbers of studies on the ways in which children develop and learn. As children spend so much of their time and energy on play every day, philosophers, researchers, and parents alike are agreed on the role of play in the child's development. The benefits of play range from those related to the developmental stage of children's life to those involving general preparations for skilled adult actions. The emergence of small families, of solitary play alongside the television set as well as computers, and the pressure of parents to send their kids to after-school classes besides the prohibition against playing in the dangerous outdoors have all made it more difficult for children to develop their social and motor skills; but among the mentioned factors there are two main ones that have affected the time available for free play among children:

**I.** One of the main factors is that children spend many hours in front of the TV and the computer screen, and on playing games, instead of playing outside in a natural environment.

Many parents in Japan today are very concerned and have daily problems with their children over the following kind of issues concerning video games, multimedia, and similar devices. (Shimauchi, Y. 1999). Terumoto Kiyokawa, a researcher at the NHK (Japan Broadcasting Corporation) Broadcasting Culture Research Institute and director of the nonprofit organization Children and the Media, warns, "The cultural environment in which Japanese children grow up is a hazard to them and to society as a whole". Kiyokawa argues that the culture that shapes and controls children is a "media culture" dominated by television, video games, computers, and cell phones. He believes that the mental and physical development of Japanese children has been fundamentally altered by electronic-media exposure amounting to six hours a day on average for the majority — a level Kiyokawa describes as "media saturation."

**II.** Another factor is that parents force children to attend various classes after school, Many kids go to after-school classes to attend lessons in nonacademic subjects such as art, swimming, as well as academic subjects such as math or foreign language, every day or some days a week, spending an hour and a half to three hours each time. Naohiro Ogawa, professor of economics at Nihon University, said that " Right now there are three abnormal phenomena going on in Japan. According to the Economic Planning Agency of the Japanese government, they call it the three "two much"

phenomena. The first "too much" phenomenon is that Japanese children study too much. In Japan 1.6 million kids enroll in the Kumon program, and according to government data 48% of primary school kids go to Juku. (Ogawa, Naohiro 1997)( Juku is an interesting component of Japanese education. It is the thriving industry of juku and yobiko, after school "cram schools,").The most negative effects of this life style are the loss of physical activity and dexterity, the preponderance of solitary play, the loss of social skills, escalating violence, and less contact with the natural environment.

Of course the negative effects of having limited free play differ from one society to another. For example, in Iran psychologists and physicians warn that the children have inadequate dexterity and obesity is increasing among them. Japan and US are two developed countries one in the east and the other in the west of the world. Computer games are very popular among American and Japanese children. The problems that are discussed in the two countries about children and media are different to some extent. In contrast to the US, where the discourse tends to focus on loss of sexual innocence and negative media images, in Japan, the loss of social skills and social values, peer interaction, and community interaction are seen as the most dangerous threat to today's media kids. (Mizuko, Ito 2002).

Working under the hypothesis of decreasing social and physical activity of children in our society, the discussion here is focused on the social and physical skills of children as two main items of children's developmental needs.

## 2. 1. THE IMPORTANCE OF SOCIAL DEVELOPMENT

Establishing relationships with others is one of the human needs important for progress and evolution. Growth does not occur in a vacuum; it involves people and experience, some of which exert situational, and others more permanent, effects (Cohen, Stewart 1976). Social competency is of critical importance in both the present functioning and future development of the child. Social skills are not only important in regard to peer relations but also allow the child to assimilate social roles and norms (Michelson, Larry 1983). When a child starts academic learning at school, the most basic skill for her/him is social skill. Consider a student with poor social skill who is not able to take turns when communicating with others in a group she or he is not ready or

able to concentrate on academic learning. Children learn best when there is balanced support for their social, emotional and cognitive growth. The opportunity for social play with peers is an essential contributor to healthy development (Hartup, W.W. 1976). Recent studies in brain development has shown that a child's ability to interact with other children and people, control and express her/his feelings, and take care of basic self-help tasks independently are as (or even more) important for success in school as academic skills. There are many factors that contribute to the development of social skills, but for children play is a central way of social development. The experiences of play in a group provide children with the opportunities to learn social skills such as sharing, taking turns, and cooperation.

## 2. 2. THE IMPORTANCE OF PHYSICAL DEVELOPMENT

Physical development in children comprises enhanced skills and functions of the body. As they grow in height, weight and body size. The physical development of children starts with gross motor skills, which involve control of large muscles in the body such as those in the arms and legs. There are certain fundamental movement skills that must be developed during the preschool years and further refined during the elementary school period. These are not dependent solely upon maturation but must be improved through regular instruction and practice (Seefeldt, V 1984). Well-developed physical skills help children to build confidence, self-esteem and independence. Most children are naturally active and have a lot of energy. Movement, action and motion are essential to a child's development (Olds 2001). Children can develop and refine their gross and fine motor skills as they play with objects or during active play in a play area inside or outside. During active play in playgrounds the different equipment gives them a chance to test his/her skills and involves him/her in many large motor activities such as running, jumping, hopping, balancing and climbing. Physical play is beneficial for the child's body health and can reduce the risk of obesity among young children. Also, physical play is believed to be essential in establishing human relationships with others and finding one's place in the group (Stine, Sharon 1978).

## 3. METHODS

This research follows the four steps below:

1. Review the literature on children's play and their physical and social development in present societies( which is discussed in the Background section above);
2. Interview some Japanese mothers;
3. Observe the equipment at 40 playgrounds in Chiba city;
4. Observe children's play activities at the playgrounds involving the use of the equipment.

#### 4. INTERVIEW INVESTIGATION WITH SOME JAPANESE MOTHERS

It was found from the research related to children that the kinds of play activities of children at present societies have been changing. For this reason it seemed that a case study investigation by interviewing some Japanese mothers could help provide the data needed. The interviews with the mothers were conducted for the purposes below:

1. To get more information about the kinds of play and activities of children in Japan.
2. To get to know about the most important factors and the challenges in children's development from the mothers viewpoints.

In the following table the information on the investigation is shown (table1).

The methods of interviews:	Group interview and separate interviews
Date:	March, April and May 2005
Place:	My house and community hall
Methods of recording;	Writing on the question form as well as recording on IC recorder
Subjects:	Seven mothers from age 32 to 40 years old
Numbers, ages and gender of children:	Total of kids 11, Girls from 4 to 10 years old, Boys from 5 to 8 years old
The items of investigation	Personal information of their family, residence, daily life schedule of children, play and activities of children, mothers' aspiration about present situation of play.

Table 1: General information related to interview investigation.

#### 4. 1. THE INTERVIEW INVESTIGATIONS FINDINGS

Seven mothers from 32 to 40 years of age were interviewed. They are mothers of 1 to 2 sons or daughters. Totally eleven girls and boys from the age to 10 years of age were involved. The results of the interviews have given us interesting information about the children's play activities. Among the different kinds of in-house play activities the most common are playing games, and secondly playing with game cards. The other activities mentioned by the mothers are: figure doll, origami, spinning top and other activities such as drawing and reading books.

Attending after-school classes was common among the interviewed mothers' children. Almost 81% of them had attended after-school academic or sports classes from the age of 5. Among the sports classes attended swimming class were the most common regardless of age and gender. As for academic subjects two of the kids were attending English classes, and Gakken. (Gakken is study and research class for children).

## 5. OBSERVATION INVESTIGATION ABOUT PRESENT SITUATION OF OUTDOOR PLAY EQUIPMENTS IN CHIBA CITY

In this investigation more than 40 playground in Chiba city located in different wards areas have been studied, including some playgrounds in Inage ward, Mihama ward, and Chuou ward.

The objective of this investigation was to understand:

1. What is the present condition of the playground equipment?
2. What kinds of play structures and elements are in the playgrounds of Chiba city that are related to the development of children's social and physical skills?

With the aim to study outdoor playground equipment in terms of social and physical developments. At first step the playgrounds located in the different Wards of Chiba city in the same areas where the interviewed families lived were chosen for this case study.

It is necessary to recognize the number and availability of the elements that provide children with different challenges. The variety of playground equipment is great. Each of the play structures may have at least two or even many of these different elements. The general information on the investigation is shown in the following table (table2).

The methods of investigations:	Observation investigation
Date:	January to October 2005
Place:	Chiba city, Chuou, Inage and Mihama ward
Methods of recording:	Taking photographs and recording notes.
Subjects:	Playgrounds with combination play set
Numbers, ages and gender of children:	40 play set combinations

Table 2: General information related to observation investigation

## 5. 1. ANALYZING THE SAMPLES ACCORDING TO CHILD DEVELOPMENTAL OBJECTIVES

The play equipment was analyzed in terms of the social and physical development needs of children. The needs were identified in the literature review on children's development. The needs related to physical development include the large muscle skills desired; and the needs related to social development are those found in social play.

To analyze the Chiba city playground equipment in terms of social skills development the children's social play must be itemized. Children's social play starts with parallel play. In parallel play, a child does not interact with other children directly but what the children do are the same. Parallel play was categorized into 3 items for analysis as follows:

**Parallel 1:** The child plays independently, close to other children whose activities are the same, such as double slide, wide slide, and multi-user climbers.

**Parallel 2:** The children take turn to use the equipment, such as those items that cannot be used at the same time by two children, like slide and swing.

**Parallel 3:** The child engages in the same activity as other children at the play structure but not close to each other as in the parallel 1 situation, such as play structures that have two slides, or climbers.

The second stage of children's social play in relation to other children is associative play. That was categorized into two items for analysis as follows:

**Associative play 1:** The equipment which requires playmate and involves communication, such as game panels like Tic-Tac-Toe Panel.

**Associative play 2:** The equipment or areas that potentially can provide associative play activity such as playhouse and sand play area.

The third stage of children's social play in relation to other children is cooperative play, which was categorized into 3 items as follows:

**Cooperative1:** The equipment that cannot be used alone that must be need with peers such as seesaw.

**Cooperative 2:** The equipment that can be used alone or with peers, but when using with other kids it works better. Such as Merry go round.

**Cooperative 3:** Some equipment meant for group use as well as individual use, such as tire swing.

The desirable large muscle skills that should be developed during childhood have been discussed in many articles. They are Climbing, Sliding, Swinging, Rolling, Bouncing, Lifting, Balancing, Pushing, Jumping, Pulling, Hopping, Hand-over-hand, Skipping, Hanging by arms, Creeping, Twirling, Spinning, Crawling and Knee walking which are considered as the items of physical development in the analysis. The large muscle skills developed by the equipment in the Chiba playground samples are as follows:

1. **Balancing:** The main equipment that provides for balance skill development included balance bar, suspension bridge, log roll, climbers, seesaw, and net mesh.
2. **Bouncing:** The best equipment that provides for bouncing skill development is trampoline, which was not seen in the Chiba samples, but children were seen bouncing on some suspension parts such as net mesh.
3. **Creeping:** Low entrance parts of structures can provide for children's creeping skill development.
4. **Crawling and knee walking:** Tunnels and tube slides are suitable for developing these kinds of muscle skills.
5. **Jumping:** Can developed on decks and structures that have different heights.
6. **Hand over hand:** this involves lifting the body up by holding onto something like a rope. The equipment available included rope ramps and cliff climber.
7. **Hanging by arms:** Playground equipment for upper body activities, such as monkey bar, and trolley slider, can provide for the development of this muscle skill.

8. **Hopping and Skipping:** The equipment that can provide for the development of these skills are hopping pods.
9. **Lifting:** There was no equipment that provided for lifting skill development at the Chiba samples.
10. **Pushing and pulling:** The Swings provide for the development of these skills to children to some extent. The other equipment is trolley slider.
11. **Rolling:** The development of the muscle skill of rolling was not completely provided by the equipment at the playgrounds samples. The only equipment related to rolling was Log roll.
12. **Sliding:** There are many kinds of slides in different shapes and materials that provide for development of their skill. The other equipment was fire pole.

Some of the equipments that have been named in this section are shown in the following figure.



Figure 1: Some of the play equipments at Chiba city.

These items mentioned above are related to children's social and physical skill development and were used to analyze the playground equipment in Chiba. The frequency graph for the items of social and physical skill developments are shown in the following two tables (Tables 3&4).

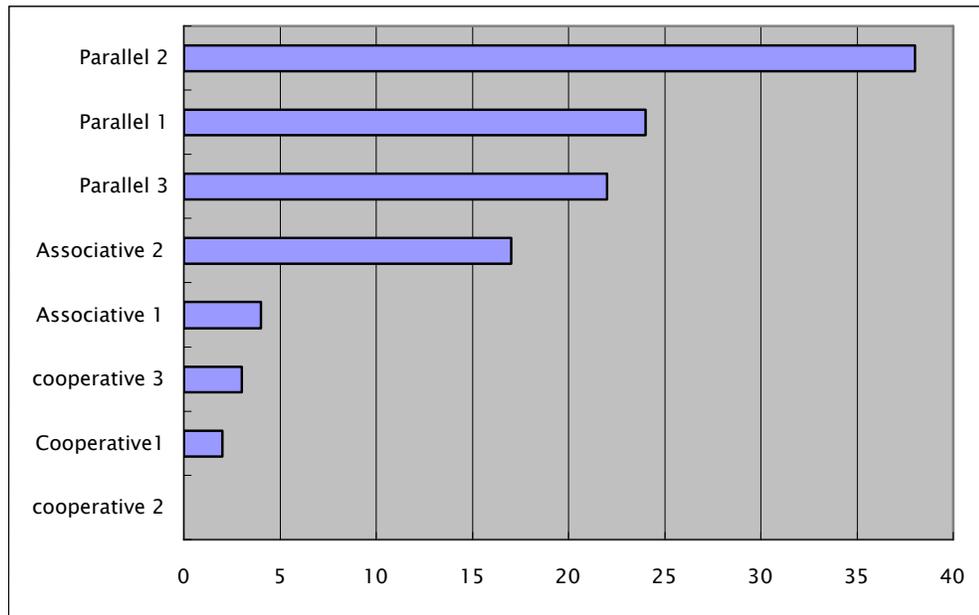


Table 3: Frequency of social skill development at samples of Chiba city.

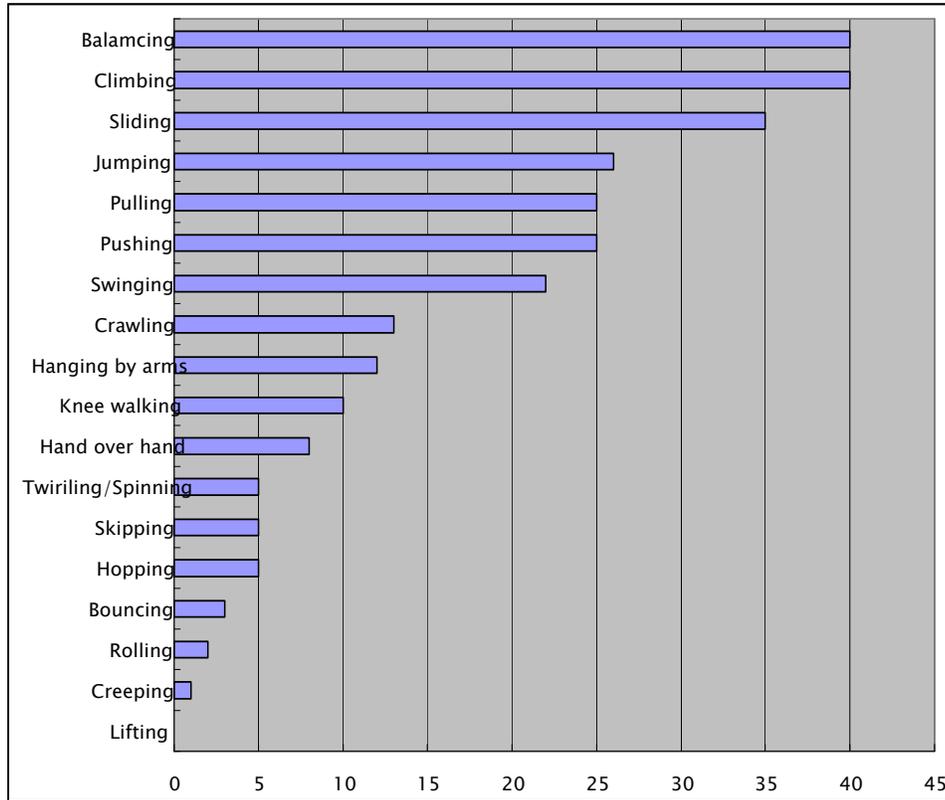


Table 4: Frequency of physical skill development at samples of Chiba city.

## 5. 2. THE INVESTIGATION FINDINGS

The results of the analysis of the equipments in the playground samples of Chiba in terms of the items of desirable motor skills and social skills show that:

- There is no equipment for lifting.
- For the pushing and pulling skills there is no suitable equipment.
- For creeping and rolling skills the items of equipment available are few.
- Cooperative social play is rare.
- The equipment that can encourage children to play in groups is not available.

## 6. OBSERVATION INVESTIGATION OF CHILDREN’S ACTIVITIES

## AT PARKS

Each type of playground equipment is designed for special specific activities. For example the slide is for the purpose of sliding down from a higher place. Now the variety of outdoor playground equipment is increasing. We can see many kinds of slide differing in form that provide for different ways of sliding. But there is another important factor besides the original intention of the equipment design. During the investigation of the Chiba city playgrounds, it was seen that children used some of the equipment in different ways. It seemed that the children were looking for more challenging activities at the playgrounds. After the first investigation of the playgrounds, the next step was to observe the real activities and behavior of children using the playground equipments. During the six months of investigations at the different playgrounds, the activities of children were observed and recorded by taking photos and written notes. The information on the investigation is shown in the following tables (Table5).

This investigation was conducted for the following purposes:

1. To get to know about how children acts at play equipments
2. To get to know about children's needs and expectation for playground equipment.

The methods of investigations:	Observation investigation
Date:	April to October 2005
Place:	Chiba city, Chuou, Inage and Mihama ward
Methods of recording;	Taking photographs and recording notes.
Subjects:	children's playing at playgrounds with combination play set

Table 5: General information related to observation investigation.

### 6. 1. THE INVESTIGATION FINDINGS

Children use equipment in all possible ways, regardless of the original design intent. In the observational investigation, children's behavior when using the play structures or

playground equipment was recorded. At the playgrounds observed children of different ages came to play. Usually during weekdays when the weather was fine and was not too cold or too hot, the first user group were very young children around 2 or 3 years old accompanied by their mothers. Sometimes in weekends they were seen with their fathers. When the young children played with the equipment and they were with their parents unusual activities were not seen. The usual activities seen included sliding, swinging or climbing up the equipment at the structure, and at some playground playing in the sand play area. The other user group was children of elementary school years or older preschools kids around 6 years old or older. They came to playgrounds mostly in the afternoon hours. When these older children were playing at the playgrounds some interesting activities were seen. The figure and table below show the activities of the children using the play equipment (figure 2),(Table 6).



Figure 2: Children's activities at the equipments.

Structure	Activities of children
Tube slide	Sliding Crawling from down to top of inside slide Going up over the tube
Roller slide	Sitting Sliding Standing sliding Back sliding Parallel play (peer) Putting objects on it for sliding
Slide	Sliding Going up
Swing	Sitting swinging Standing swinging Two kids at the same time (one is sitting and another standing) Swinging with different body position
Suspension bridge	Transferring between two sides of structure. Standing with friends over it and jumping in it. Jumping from it Going to outside of its fence Hanging from its fence to go down
Net mesh s	Climbing Sitting with friends Lying down
Climbing	Climbing Competition
Quiet play area (Play house)	Playing roll play Sitting with other children and talking Playing games and card games

Table 6: Children's activities at the equipments.

## 7. DISCUSSION

In this research after reviewing the articles on children's play it was understood that the lack of time for free play was the most threaten factor for child developmental

objectives. And the interview with some Japanese mothers made it clear that also the mothers are not satisfied with the situation of children's play at present. When asking the mothers about the dissatisfactions of children's play; 5 mothers answered that digital games are not good, and consider it as a disadvantage for children. The points that they mentioned are about the problems of lacking physical and social skill developing, which caused by playing with games for a long times. The mothers expressed that they want their children having more physical activity and being able to communicate with other children and people. It means that for the mothers it is very important that their children learn two skills the physical and the social.

Not only the mothers emphasize on the development in physical and social skills of children, but also the children's educators and psychologist warn us about the importance of these two fundamentals developing stages to children that now is at risk. The designers should consider these two developmental objectives to design equipments which could provide children well desired developments. So in next investigation focused on the social and physical developments of children according to the outdoors play equipments. After driving the items of social and physical developmental play for children the relevancies between those developments with the play equipments were studied. From the results of analysis samples of Chiba playgrounds with the items of desired social and motor skill developments; it was found that cooperative social play are rarely available, for example a kinds of group play equipments that children can get know with the benefit and success in the group work is not exist. For encouraging children to have more social interaction with other kids, one of the most important opportunity is to provide them the play and activities which needs more children to get better results, for example Merry-go-round is one of the perfect equipments that encourage social cooperative play in a great extend, since it works better with more kids. Now in the present playgrounds these kinds of equipments are not available, the concept of encouraging more cooperative and associative play among children should be considered as the most important factors for designing child playground.

In the results of physical skill development providing to children by playgrounds equipments, it was found that for some of the large muscle skill development there is no equipment for example there is no equipments for lifting, and for others like creeping and rolling the available equipments are not much. For the pushing and

pulling equipments there are not suitable equipments. Some equipment must be designed specially to help children to develop their pushing and pulling skill.

During observations of playgrounds, the users had some special work with the equipments. These special behaviors bring some questions in mind. Why do children acts in other way at the equipments? There are many reasons that caused this special work of children; some are related to the equipments, and some to the characteristics of children, the reasons such as the equipments are not fitted with the real needs of children. So the needs of children should be recognize to design such equipments to provide their wants and wishes considering the developmental objectives.

Children naturally test their skills at different areas; children learn to develop some essential skills during childhood as they are playing, especially during the free play. During the time looking at the activities of children on play equipments we understand the events that can be useful to specify the misfits of the play equipments with the new expectations of children. If the equipments don't give the users the appropriate advantages so they act in the other ways.

In some cases there are not the uneasiness about the safety of children during their special acts for example it is seen that many children enjoy from going up from the sliding area of slide that it does not put children in dangerous risk. But this is not same at all conditions; there are many situations that may be a threat to children's safety for example in some high areas. It has been observed that children go to the some high parts of the equipments that are not intended for going up from, for example many children have been seen that were on the roof of the a high play structure, of course the roof was not considered as a climbing area by the equipment designers, but because of some reasons this behavior is happening. It is obvious that all play equipment makers consider the guild lines for safety of children on the play structure but when children acts in other way, the safety factors find challenges. According to the Handbook for Playground Safety, the Recommendations for the fall heights for various pieces of playground equipment are completely explained. But sometimes children find the other way of playing on a play structures that may be not safe to them.

The safety factors about the equipment can be understood by recognizing the real acts of children. On the other hand the activities of children can be considered as a

proposal for some new equipment. Because children have a lot of experiences in playing with an equipment item, they discover challenging ways of using it. For some children some changes in the equipment item could make them use it for a new activity. The play environment of children should be enriched the equipment to give children more opportunities to learn and develop their essential skills.

## 8. CONCLUSIONS

In this research problems among the new generations of children were identified. It was found, from both the viewpoints of expert children researchers and mothers, that what is the most threatening to children's life is having fewer opportunities for desirable physical and social activity. The items of children's social and physical developmental play were specified and the relationship between children's development and the play equipment was studied. Investigative research focusing on user behavior was the key to gaining and understanding of how the playground equipment is actually used by children.

Keeping the development of children in mind during the user-focused investigation yielded important data in regard to the shortcomings or inconveniences suffered by the users of the play equipment. This information could be obtained watching very closely the actions of the users as well as listening to who accompanied their children to the playgrounds or who had specific expectations about developing their children's skills. This may provide certain data that may have gone unnoticed by the designers. The unnoticed facts are those that cause the children to act in unexpected ways at play structures.

Effective and satisfactory playgrounds should provide support for children's development. The key to providing the most effective design solution lies in watching, listening, and carefully considering the behaviors, opinions, and needs of playground users including both the children and the parents, and considering this information with child developmental objectives to create the new generation of play equipment.

This study was based on the patterns and nuances of the actual behavior of children at public play structures, reacting to this data with the analyzing the play structures with the items of social and physical development skills and then answering with the

suggestions of possible design solution for the design of these equipments. These suggestions can be applied to a specific design situation that provides planners and designers of public playgrounds with a reasonable basis for design creation, and more studies will bring new concepts for children's play at public playgrounds.

Another fact that have been understood from the children's behavior is to pay attention to the local and cultural activity and play of children that may need special emphasis, such as group activity to provide for more social skill development.

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