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Presenting Architectural Solutions to Improve Social Skills of Working Children

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ABSTRACT: Working children, like any other child, must learn skills that are necessary for childhood in order to communicate with society and develop their personalities and emotions. Children who work typically cannot learn these skills because of their living circumstances. The current study aimed to provide a suitable environment and context for the improvement of children's social relations in educational and care centers by providing workable solutions that are appropriate to the morals and social needs of working children to improve their social ability and skills. This is because one of the most influential factors in learning and improving children's skills is providing an environment in harmony with the needs of children in line with that skill. This was applied descriptive-analytical research in terms of method and qualitative and was performed using direct and non-interventional field observation coding. According to the results, factors such as playability of the environment, a sense of security, environmental attraction, event-ability, proper furniture, curiosity about space, connection to nature, breadth of vision and scenery, permeability, climatic comfort, a sense of belonging and space flexibility affected the improvement of working children's social skills. Meanwhile, the playability of the environment and connection to nature play the most important role in the formation of social behaviors and the improvement of social skills in working children.

Keywords: *Working Children, Architectural Spaces, Social Skills, Playability, Naturalism*

INTRODUCTION

Especially in developing nations, the phenomenon of "Child Labor" and "Working Children" is one of the most widespread problems in the world. Employing minors when they are at their most vulnerable has long-lasting effects on people and society. UNICEF defines street and working children as: "youth/children who live and work in the streets, unaccompanied by adults while in the street, and without protective care from parents" (UNICEF, 2001). In Iran, however, the concept of working children is defined slightly differently; most of the working children live with their parents, but they spend most of their time on the streets and return home at night (Hosseini, 2006). Accordingly, workers under the age of 18 are called working children (Tabarsi et al., 2017). It is estimated that there are more than 500 million working children in the world (Fassa et al., 2000) and about 1.6-2.1 million in Iran (Rashidian et al., 2014). This figure shows that children, who are the most vulnerable group and exposed to all kinds of psychological and physical injuries, make up a considerable portion of society. Children on the street experience significant pressure and are vulnerable to abuse, neglect, deprivation, violence, and crime due to a constant struggle among them (Ali, 2011).

Studies suggest that compared to other children in society, physical, mental, and social disorders are more common among working children. For instance, 35-85% of working children deal with emotional and behavioral issues, including low self-confidence, depression, and poor social interactions (Moradi et al., 2016). In fact, working children's social skills and abilities suffer the most because of their lifestyle and experiences. Because they live under constant pressure and tension, working children lack psychological security. Therefore, they often fail to express themselves freely and develop appropriate social relations with their peers (Ghorbani Param, 2022).

Learning social skills and establishing effective relationships with the surrounding people are among the most important achievements during childhood. Nonetheless, most working children fail to acquire this skill and, therefore, deal with negative reactions from others (Akbarzadeh et al., 2014). Children enter their peer group and form the basis of their social life through acquiring social and communication skills such as cooperation, compromise, communication, and making friends (Stuart & Sundeen, 1995). Recent studies have shown a relationship between

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a lack of social skills and the emergence of current and future behavioral disorders. Meanwhile, working children have poor relationships with their peers because of their living situation and lose the opportunities they could have with their social skills. Therefore, they are socially isolated people who prefer depression and loneliness (Green et al., 1980).

On the other hand, it has been proven that the social function of architecture and the power of the created environment plays an important role in the development of collective relationships between people in the built environment and places (Khodabakhshian & Taghizade, 2020). Even though architecture and the physical framework of space have no direct effect on the quality, content, or number of social relationships, an architect can create a platform and conditions so that people can start communicating with each other in peace by creating an environment that suits their needs and matches their mood and desires (Ghorbani Param, 2022). In addition, they can boost people's social skills by designing places for meetings and active listening, which is a foreground for other forms of sociability and communication. In different environments, the physical environment acts as a spatial system, the features of which affect the social interactions of users (Pasalar, 2003).

One of the necessities of the present research project was weakness in the field of studies related to the design of centers for working children in Iran; firstly, spaces used for working children in Iran are just premade places that have been repurposed and lack any correct theoretical and intellectual foundations. Secondly, there is a research gap in the field of architecture for working children in Iran. In this regard, the current study aimed to answer the following questions: based on their social-behavioral patterns, "What are working children's main demands of their physical environment?" Based on their moods and lived experiences, in "what kind of environment do work children feel mental peace and can interact and communicate with others?" Answering these questions can help us identify the physical factors affecting the social skills of working children based on their behaviors, which can then be used to offer architectural solutions, not just for operating space with a certain usage but based on the working children's needs, demands, and behaviors. This can lay a proper foundation for children to connect with their peers, improve their social skills, and be accepted in society as ordinary people in the future, regardless of the constant tension and anxiety they experience in life.

RESEARCH BACKGROUND

Research on the physical surroundings and social skills of working children is scarce, both nationally and internationally. The present study focused on three fields: working children and built environments, built spaces and social relationships, and working children and social skills. However, we mostly assessed the studies conducted in the country due to the higher impact of cultural and identity issues in this area, some of which are summarized in Table 1.

Table 1. A summary of studies done on working children

Title	Authors and Year	Result
Guidelines for Designing an Effective Learning Complex for Child Labors (Case Study: City of Isfahan)	(Khodabakhshian & Taghizade, 2020)	The results based on interviews with and observance of 45 working children in Isfahan Province demonstrated the effectiveness of three parameters of well-designed physical space, sense of ownership, and social support on regaining their lost sense of identity.
Designing a Social and Educational Form and Environment for Child Labor in Tehran's 22 District	(Afshin Ghorbani Param, 2022)	The results of interviews with 15 professors, social workers, researchers, and architectural experts revealed the necessity of the role of security, attraction, scale, accessibility, and form in the architectural design of social environments for working children.
Social Health of 7-11 Years Old Children Living in Foster Care Centers	(Bayat et al., 2007)	Results showed that 45.7% of children living at these care centers, who are mostly working children, were considered moderate regarding social health, and 19.1% were considered poor. In addition, there was a significant relationship between social health and gender, whereas no significant association was found between social health and factors of health and duration of stay at the center.
The Role of Built Environments in Student Interactions at School	(Arghiani & Shakeri, 2021)	The results showed that the mental criteria had the highest importance coefficient, and the physical criterion had the lowest importance coefficient. On the other hand, the prioritization of sub-indicators showed that the sub-indicators of "length of stay" belonged to the behavioral criterion, and the sub-indicators of "accessibility of public space" had the highest importance, compared to other sub-spaces.
Designing Urban Space to Promote Social Interactions, Case Study: Inter-neighborhood Boulevard	(Ghalambor Dezfuly & Naghizadeh, 2014)	This study proposed two design guidelines to attract people to urban spaces with the aim of increasing the number of social interactions: one guideline for improving the quality of urban spaces and another one for forming social interactions in these spaces. According to the results, the type of furniture arrangement, the visual beauty of the environment, and absorbing and collective activities are the most important factors in increasing social interactions between people in urban spaces.
Public Spaces and Factors Affecting Collective Life	(Daneshpour & Charkhchyan, 2007)	Suppose sociopetaloid and improvement of collective life in public spaces are considered to be based on stages. In that case, the openness of the space to different social groups and people, supply of physical and mental peace, enjoying the space, and having an active social presence in the space, therefore factors such as invitingness, security, desirability and responsiveness of activity can be mentioned in this regard.

Studies have shown that in most countries, working children are the result of the unfavorable socioeconomic status of families (Ali et al., 2004; Aptekar & Abebe, 1997; Ferguson, 2005; Ward, 2010). A number of studies have introduced chaotic conditions of the family, such as domestic violence and lack of presence of a caretaker, as the cause of living on the street (Subramanyam, 2016; Khan & Hesketh, 2010). Some studies have mentioned the effectiveness of both of these categories of factors in this area (World Food Program, 2001).

According to the literature done in Iran, working children are at a higher risk of various physical diseases and psychological issues such as depression, suicide, abuse, and social problems, including smoking and theft (Kathuria & Pandya, 2020; Pellenq et al., 2021). Studies have also shown low social health and communication in working children (Bayat et al., 2006). In this regard, poor social skills have been identified as one of the most effective factors. Based on a study by Vameghi, even though government policies in recent decades have tended to attract children to childcare centers, there are still some infrastructural weaknesses in this area, such as a lack of proper physical spaces that could gain the trust and increase the willingness of working children to refer to these centers (Vameghi et al.,2015). In other words, these centers fail to encourage the long stay of working children, thereby being unable to improve their physical, mental, and living conditions.

Reviewing previous studies on the design of proper spaces for working children based on their needs and conditions revealed a lack of research in this area. Given the high sensitivity of the matter, it is extremely crucial to conduct more studies in this area since the health of a community depends on the social health of its people, especially children.

THEORICAL FRAMEWORK

According to studies in Iran, working children have many social problems due to their living conditions. Some of these issues include lack of proper communication with the community, limited social relations, lack of relationships with friends and family, and getting rejected by peers and other groups in society, all of which are caused by their lack of social skills and abilities. Of course, social skills and communication can be a physical matter, a glance, a conversation, or an interaction between people, which requires the definition of events and activities corresponding to it (Daneshpour & Charkhchyan, 2007). In this study, social skills are defined as a set of behaviors taught to a person that can allow them to effectively interact with others and avoid unreasonable reactions in the community (Davoudi et al., 2014).

One of the important factors for working children's poor social skills is the lack of a proper physical space that meets their social needs, nourishes them, and helps them have appropriate social relations.

In a book called "Children's Spaces," Mark Dudek (2005), an active architect in the field of space design for children, has tried to make adults sensitive and curious about their surrounding spaces and their influence on the growth and education of children using children's language. The book has a child-oriented viewpoint in order to make people more aware of the constructive interactions of the surrounding environment with children.

In fact, the author encourages people to pay special attention to the importance of the built space in establishing constructive interactions with children and its impact on their abilities. Two main concepts are identified in the area of the role of physical factors in the formation of social relations: the first concept is the interaction of space and environment with people and its effect on the formation of social relations, and the second concept is person-person interaction, which, according to Wiliam Whyte, means that the presence of a person is an effective factor for attracting other people (Ghalambor Dezfuly & Naghizadeh, 2014). These concepts respectively point out environmental factors (e.g., physical and functional factors of the environment) and the impact of people on each other, which are related to the customs, traditions, and culture of society.

On the other hand, identifying the users of a space is an effective factor in choosing a solution for improving people's social interactions and, consequently, their social skills. According to Lars Larap (1972), building a physical environment based on users' needs, which are assessed based on their psychological needs, can result in a set of social behaviors that cannot be formed in other environments. Moleski and Lang (1986) consider the sociopetaloid of spaces to be based on a triangle of humankind, space, and collective life, where responding to the social dimension of space requires attention to the identification of the user of that space. In a study by Arghiani and Shakeri (2021), the behavioral index had the most impact among other components of sociopetaloid, which shows the importance of understanding the moods and needs of the users of the space, who are working children in this study. According to all that has been mentioned up until now, we have developed a theoretical framework, as shown in Figure 1.

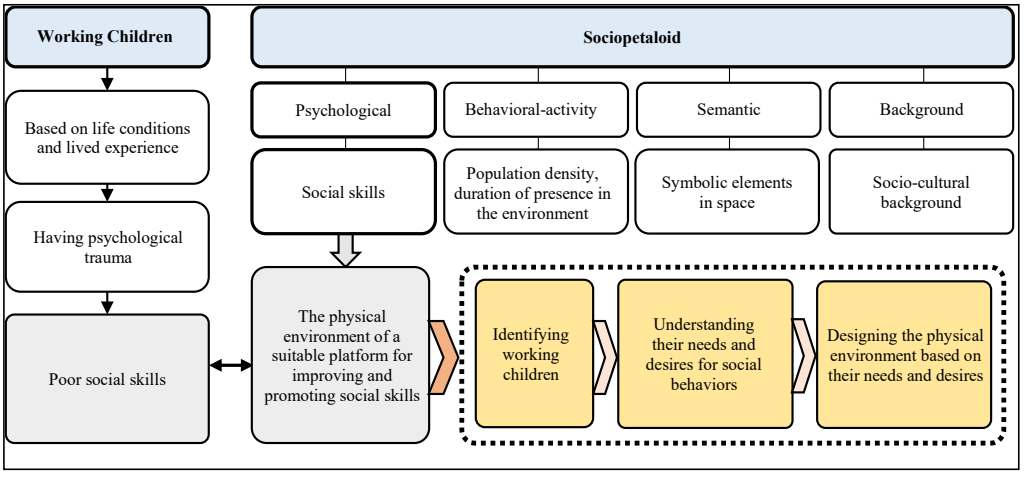


Fig. 1: Theoretical Framework

MATERIALS AND METHODS

This was applied research in terms of goal and was carried out using a qualitative, descriptive-analytical approach. Data were collected through direct and non-interventional field observations, and data analysis was performed using deductive reasoning through coding the observed behaviors. In this research, a qualitative approach and indirect observation were used to collect data because our goal was to identify the actual needs and demands of working children according to their behaviors in relation to the community and even their loneliness so that we could create a safe space for them that could be their proper social foundation. Another reason for using this approach was limitations related to this particular community of children and their lack of trust in strangers.

Participants

In this study, the statistical population included all working children in Sanandaj, Iran. In total, 42 children were selected randomly from their vending places on the street. Notably, the current research was conducted in four months, from May to August 2022.

Preliminary Data Collection

We employed the indirect observation technique to collect data related to working children's environmental behaviors. For 74 days, we referred to downtown Sanandaj, where working children often gathered at different times and observed their behaviors. To avoid the change of behavior in working children, observation was carried out without attracting their attention, and behavioral and activity maps and sketches were drawn through note-taking and drawing. It is worth noting that observation and note-taking were done by two researchers in order to record all behavioral tips and details. Also, no pictures were taken of them in order to adhere to ethical considerations.

Data Analysis

In this research, data analysis was performed using the coding technique. In addition to the study's researchers (three persons), the opinions of three architects with multiple studies in the field of environmental psychology were used in the coding process. In the first stage, each observer allocated one or several concepts to the recorded behaviors of each working child based on the sketches and descriptions recorded by observers. The process was repeated three days later in order to ensure the extraction of all concepts from observations. This was followed by the second stage, where evaluators discussed the concepts extracted in the first stage to classify them and introduce the main concepts for each separate observation of the subjects. This stage included three eight-hour meetings, where assessors categorized the overlapping concepts and introduced them as one main concept after meticulous evaluation. At the end of the stage, the evaluators expressed their level of agreement with the extracted codes by scoring them in a range of 0-10 (10=completely agree and 0=completely disagree).

Reliability and Validity

In order to ensure the validity of the codes, behaviors were recorded by two observers at each stage of the indirect observation process. In addition, three other observers were used in the coding stage who were expert architects in the field of environmental psychology. In the final stage, consensus was reached regarding the extracted codes by scoring them. According to Table 2, reliability was approved at Cronbach's alpha of 0.9 and an intraclass correlation coefficient of 0.92, which demonstrated high and satisfactory consensus among the evaluators. This confirmed the validity of the results.

Table 2. Inter-rater reliability at subjects' behavioral coding stage using the SPSS method

Case Processing Summary

		N	%
Cases	Valid	8	100.0
	Excluded[a]	0	0.0
	Total	8	100.0

Reliability Statistics

Cronbach's Alpha	N of Items
0.903	6

Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.748[a]	0.412	0.953	15.401	5	15	0.000
Average Measures	0.922[c]	0.737	0.988	15.401	5	15	0.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a. The estimator is the same, regardless of whether the interaction effect is present or not.

b. Type A intraclass correlation coefficients using an absolute agreement definition.

c. This estimate is computed assuming the interaction effect is absent because it is not estimable otherwise.

RESULTS AND DISCUSSIONS

Overall, 136 different environmental and social behaviors were observed in 42 working children, and relevant explanations and evidence were recorded. Six persons assessed the observation results in the first stage with one repetition, which led to the allocation of 39 different concepts to the observation. No new concept was extracted from mid-review onwards, which showed theoretical saturation of concepts and a lack of need for further observation of the subjects. In the second stage, which involved meetings of evaluators, a total of 12 main codes were extracted, which included playability of the environment, a sense of security, environmental attraction, event-ability, proper furniture, curiosity about space, connection to nature, the breadth of vision and scenery, permeability, climatic comfort, sense of belonging to a place and space flexibility. Some of the recorded social behaviors of working children are summarized in Table 3 to show the process of concept coding as an example. Attempts were made to provide data for each code in the table.

Table 3. Social behaviors of working children in public spaces

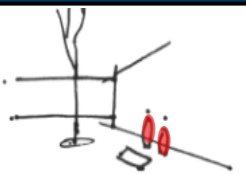
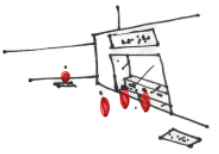
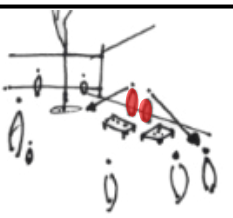
No.	Recorded observation of children's environmental and social behavior	Allocated Concepts	Sketches
1	Children No. (2, 7, 8, 9, 14, 22 and 25) often set up their vendor in a specific and fixed place that was blocked from one side and invited other children to play or talk at their spot, which was usually accepted, even for a short period.	Sense of security, sense of belonging to a place	
2	Working children No. (11, 23, 24, 27 and 31) often set up their vendor next to an attractive element, such as stores or toy shops, and invite their peers to watch their favorite toys and discuss them.	Environmental attractiveness, curiosity about space	
3	Working children No. (1, 4, 5, 6, 13, 17, 19, 25, and 26) worked at intersections. They would sell their products when the traffic light turned red, and smaller children would go to the nearby park and play when the traffic light turned green; children on swings had longer conversations compared to other children in the park.	Playability of the environment, connection to nature, proper furniture	
4	Working Children No. (2, 3, 7, 9, 10, 14 and 30) had nothing to carry and would stay in locations with a good view. They would observe their surrounding events and react to them along with their companion, who was probably one of their family members. They could show different behaviors in such spaces.	breadth of vision and scenery, space flexibility	
5	Working children No. (8, 16, 18, 21, 22, and 23) were interested in spaces that had the possibility and potential of different events. For instance, they would gather around a street musician or municipal officer who dug the street to repair the sewer pipe, ask questions out of curiosity, and communicate with others.	Event-ability of the environment, curiosity about space	
6	Working children (2, 15, 28, and 29) would set up their vendors under the shade of the trees near the street. Sometimes they would cut the grass at the foot of the trees, throw it at each and play, shout, and rejoice.	Climatic comfort, connection to nature, playability of the environment	
7	Working children No. (3, 10, 11, 23, 24, 27 and 31), who would sell stuff alone or with their mothers, would prefer to experience the surrounding spaces when their mother is busy talking to a customer or they have nothing to do. For instance, they seize the opportunity to play in the street or at least stare at their surroundings.	Permeability, breadth of vision and scenery, space flexibility	

Table 4 shows the repetition rate of 12 main codes obtained in the coding process among 136 environmental and social behaviors. In this regard, our findings are congruent with the results obtained by Khodabakhshian & Taghizade (2020) and Ghorbani Param (2022) in Iran, which introduced a connection to nature, a sense of belonging to a place, scale for legibility of spaces and access to physical environments as factors affecting the quality of environments built for working children.

Table 4. The amount of distribution and repetition of the main codes extracted from observations of working children

Main Code	Number of code repetitions	Main Code	Number of code repetitions
Playability of the environment	31	Connection to nature	28
A sense of security	11	Breadth of vision and scenery	9
Environmental attraction	14	Permeability	4
Event-ability	10	Climatic comfort	5
Proper furniture	2	A sense of belonging to a place	7
Curiosity about space	9	Space flexibility	6

Based on the above table, two codes of playability of the environment and connection to nature were repeated more compared to other codes. In terms of inferential statistics, Chi-square one-sample test results were also indicative of a higher repetition of the mentioned codes compared to other codes (Chi-square=4.31, P-value=0.001).

DISCUSSION

According to the results of the present study, two features of playability of the environment and connection to nature were significantly more repeated in working children's environmental and social behaviors compared to the other codes. These results suggest that we might be able to improve working children's social skills by providing physical conditions that can lead to the emergence of these two features, along with other features, and creating a space that could allow them to communicate with their peers with peace of mind. These findings are consistent with the results obtained by Galyer & Evans (2001), Taylor (2020), Pellenq et al. (2021), Kathuria & Pandya (2020), Lillard (2017), Hughes (2021), and Athey (2018).

Children's play is a way of expressing their inner demands. In other words, the content of a game chosen by a child to play reflects their inner demands and needs. Children embed their fears and worries in play, and, as it is known, expressing inner feeling states is a way for children actually to communicate with the world. Children showcase kindness, interest, anger and grudges, tension, failures, insecurities, fears, and confusion through play, which helps them achieve emotional comfort (Aghajani et al., 2014). Some researchers believe that playing is a way for children to connect with their peers. After a while, children feel that they are part of a large group and start a fair evaluation of their behavior and actions, as well as those of their playmates. Playing with others results in the formation of children's character for uniting and participating in a game with other playmates. It also makes children enthusiastic and creates a sense of responsibility in them (Norodahl & Johannesson, 2015). Playing is extremely important in the social development of children as well. Psychologists have found a relationship between playing make-believe games, especially complicated types, and social skills and popularity of preschool children. In fact, those who have such experiences more participate in social activities (Connolly & Doyle, 1984). Playing also increases emotion regulation skills, which is not just necessary for becoming a successful person but also helps children achieve more social success (Newland et al., 2001). Observations at preschool centers have revealed that children who are more able to control their emotions have more friends and are socially more capable (Mayberry & Espelage, 2007). In group games, children often try to talk to each other to reach an agreement (Newland et al., 2001; Lewis et al., 2000). In general, games and playing get children closer and lay the foundation for establishing social relationships and becoming friends (Hojat & Shah Hosseini, 2018).

On the other hand, open spaces and nature are among the most important physical features that can promote dependence on society and social skills in people (Maas et al., 2006). Here, nature means natural living and non-living organisms such as greenery, soil, sunlight, water, changing seasons, and animals (e.g., birds, dogs, and cats). Children will physically, psychologically, and linguistically grow if they have the chance to come into contact with living things, such as plants and animals, which also change with the change of seasons. This also increases their empathy toward others and enhances their social skills (Herrington & Lesmeister, 2006). As one of the most important natural elements, green spaces can lead to anger management, stress and fatigue relief, an increase of excitement and vitality, motivation to be physically active, and improved social interactions, thereby enhancing social relationships in society. The presence of trees and grass in public spaces can attract people and increase the amount of social activity. There is a positive relationship between the number of green spaces in the living environment of a person and their loneliness and lack of social support, especially among children, the elderly, and sick people (Maas et al., 2006). Since children communicate more with each other in natural spaces, outdoor children's games seem to be a great opportunity for them to improve their social and psychological skills (Bouzendan, 2019).

After discussing the importance and effectiveness of two concepts of playability and connection to nature as the main two codes identified for creating suitable environments for working children in a way that could

improve their social skills, some architectural solutions were suggested to design and build physical spaces belonging to working children.

Playability of the Environment

Regarding the playability of space for working children, the first point was that they play with their peers in certain spaces that match their mood and where they feel at ease. Based on our observations, working children would start playing next to crowded shops, near the main street that is full of vehicles, and often in a secluded corner. This shows that they have different approaches to where to play. Therefore, an architect must design a playground that has a certain characteristic and is distinguished from other places. A playground must create different playing opportunities, meet the needs of children of different ages, answer their questions, increase facilities, and have various sceneries. Providing conditions for playing different games is one of the necessities of playable spaces for children. In this regard, our findings are in line with the results of studies (Herrington & Lesmeister, 2006) and (Norodahl & Johannesson, 2015), which emphasized harmony between children's playgrounds and their emotional needs and demands.

Our findings also revealed that working children spent much less time playing in spaces that had limited environmental elements. These environmental elements and incidents can be the size of plants, different furniture pieces, and various natural elements such as water and soil. Children can play with seeds and leaves produced by trees and plants forever, talk about them with their friends, and make fantasies about them, which also improves their verbal communication. Given that they regard the entire surrounding of a child as a playground, nature can be a suitable place for them to spend many hours, play freely, explore, and learn. In a study (Connolly & Doyle, 1984), it is mentioned that students search for five elements in a playgroup: a place to do the game (opportunities for physical activity), a place to think (opportunities for intellectual stimulation), a place to feel (stimulating a sense of belonging) and a place to be (let them be themselves). In accordance with these findings, it seems that nature has all of these features. Therefore, a favorable playground for children must have plenty of natural elements, such as plants, water and soil, sand, animals, and insects.

Working children's behaviors when they played with each other showed how a playground can affect the quality of desired spaces of these individuals. These children do not choose a space with difficult access as a place to play, even if it has many facilities. Working children are also more attracted to environments that have a direct physical and visual connection with the surrounding environment.

Regarding spatial legibility, our findings are congruent with the findings obtained by Khoramshad and Safavi (2019). In general, spatial legibility affects the time spent using that environment, making more space available, comfort and feeling of security among children, the development and accuracy of cognitive maps, navigation, and spatial and social behavior (from visual encounters to long conversations), which increases the potentials of establishing social relations among people (Matlabi et al., 2018). Large play structures reduce spatial transparency and legibility and cause confusion and lack of playing. On the other hand, simple plans that prioritize children's movement and scale avoid any confusion in these spaces (Herrington & Lesmeister, 2006).

Observations showed that mysteriousness was one of the effective features of playgrounds for working children. In fact, one of the necessities of playgrounds is creating spaces such as gardens and dirt hills where children can have exploratory activities. Here, mysteriousness means a certain amount of hidden information in space that can be found in children. Environmental stimulations engage people mentally through complexities and mysteries (Tabatabaian et al., 2017). Another playability feature for working children is chaotic spaces, which Jim Greenman first called "messy zones." These spaces have dig places, watery places, and sandy areas where loose materials stimulate children's imaginations and enhance their ability to mold, shape, and move. In fact, these places allow children to design their playgrounds (Herrington & Lesmeister, 2006). Figure 2 classifies the features of playable physical spaces and architectural solutions for these places based on the observations of working children into six categories.

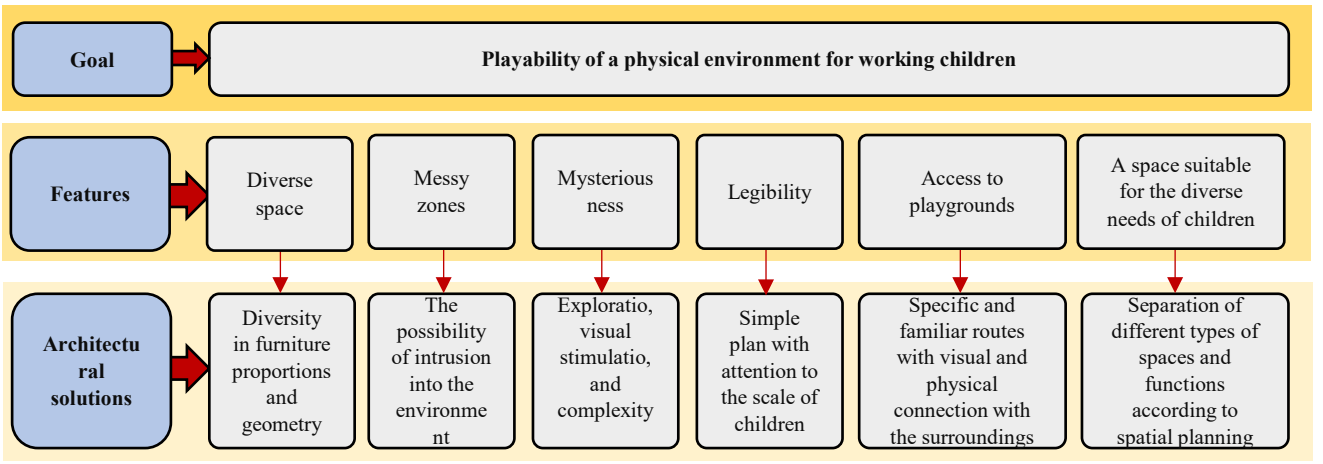


Figure 2. Architectural features and solutions to create playable physical environments for working children

Connection to Nature

As mentioned, a connection to nature can improve working children's social skills by affecting their mood and as a proper foundation for social behaviors. In order to establish a suitable connection to nature in spaces related to working children, we can use elements such as form and shape, scale, proportions, texture, color, geometry, and topography in built spaces. Here, we offer some practical solutions based on the observations and previous studies so that architects and designers can create a connection to nature in spaces related to working children in order for the emergence of social behaviors in these individuals.

Given that working children spend most of their time in natural and urban environments and experience social relations with others, natural elements or replicas of the sun, trees, clouds, rain, animals and birds, rivers, mountains, colorful flowers, lawn, and wooden hut could be used to create a physical environment that reminds them of nature to help establish their social interactions and behaviors. According to Soleimani et al. (2023), these elements are the most frequent components of children's imagination and their desire for nature, which can be used to establish a suitable relationship between children and the natural environment. Using these familiar elements, designers can increase a sense of belonging to space to working children and turn the built space into a safe place that is familiar to places where children spend most of their time. However, designers must use replicas of natural elements with small sizes that match children's scales and many details in order to increase the chance of connection between working children and nature. These features help increase a sense of protecting nature, which is one of the factors affecting the relationship between children and nature (Soleimani et al., 2023; McDevitt et al., 2012). In this regard, using many large windows can be another architectural solution for establishing a connection between working children and nature in built environments (Taylor, 2020). This blurs the boundary between the physical environment and nature, and children feel that they are in nature at all times.

In addition, observations revealed that most of the time, working children formed communication behaviors with their peers, such as talking or playing, as much as possible where there was a more natural texture, such as next to trees, next to streams of water, on grass, or on parts of the ground that had dirt. Therefore, attention should be paid to preserving the natural environment as much as possible when designing a space and natural elements such as water and soil. It should be used in these places. These natural elements can be used in different ways for children to play; for example, a place could be provided for children to touch and play with water. The type and texture of flooring materials in areas built for working children also affect the quality of the relationship between working children and nature. In this regard, it is recommended that natural materials such as grass, stone, or soil should be used. It is also suggested that artificial routes be avoided and that the natural foundation of the place be kept when designing communication and access routes in these spaces. This is mainly because building a clear path for children to pass makes them not feel close to the natural environment and look at the natural elements from an outside perspective.

Working children pick colorful flowers for their friends, and our observations showed that they obsessively picked flowers of different colors and put them next to each other. Their interest in color was observed in other situations; for instance, they would become attracted to the colorful lights of shops or colored flours. They also collected different colors of tree leaves and would talk to each other about them for hours. They would even collect barks of trees with different colors and play with them. Therefore, the color of the physical elements and spaces in an environment seems to play a role in connecting with spaces designed for working children. In this regard, it should be mentioned that using colors that remind of natural elements can play a significant role in creating a connection between the child and the physical environment. For example, applying colored glass (which leads to the production of different colors of the light spectrum) may stimulate the child's curiosity. In this case, light, which is considered a natural factor, is considered a stimulus for the child to communicate more with nature. Moreover, trees with the ability to change, such as deciduous trees that change during each season, are better options when choosing green species. In this respect, our findings are congruent with the results obtained by Khodabakhshian & Taghizade (2020) and Ghorbani Param (2022), which suggested the creation of fluid spaces and spiral and natural paths and the use of color in the design of environments for working children.

Based on the observations, working children often start changing their surrounding space when working in an environment. Some of them would separate their personal space from the surrounding environment using stones and tree branches. Some of them even used rope or cardboard to mark their personal activity areas. Therefore, creating spaces where children can feel their impact on the environment through changes in the space or protecting it can have an impact on the relationship between children and nature. Therefore, designers can use flexible spaces to make changes in natural spaces and respond to the different needs and demands of children from nature. Using changeable elements in the wall and floor, such as movable walls and floors, can be very useful because children can change them based on their thoughts and experience more peace. These findings are in line with the results obtained by Herrington & Lesmeister (2006) and Chegeni et al. (2020), who talked about flexibility as an effective component in the design of children's environments and connection to nature. According to Figure 3, features for creating a sense of connection to nature in the physical environments specific to working children and the architectural solutions that create these spaces can be divided into six categories based on the observations.

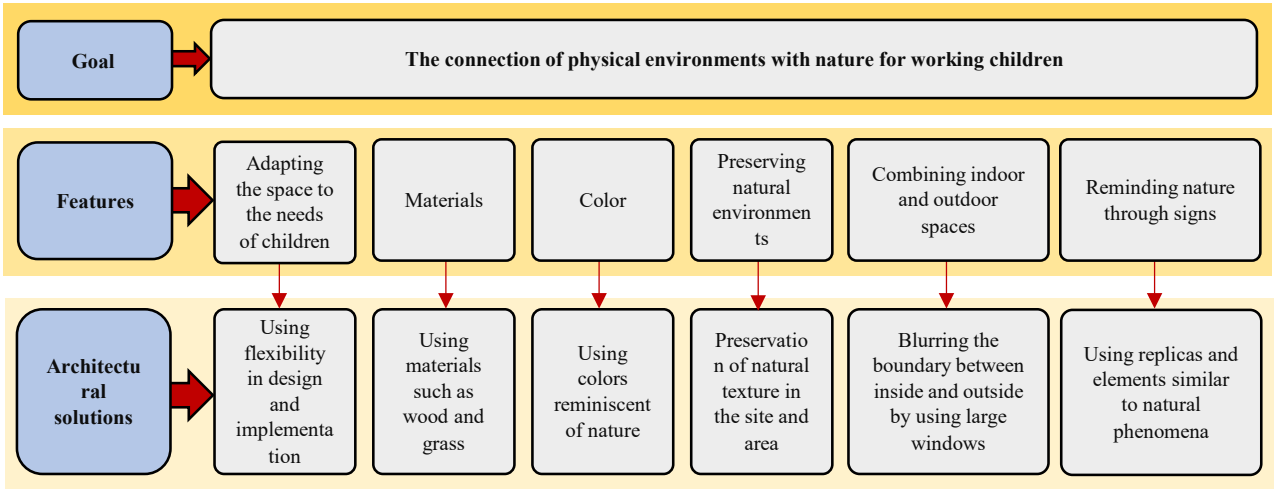


Figure 3. Architectural solutions and features of the relationship between physical environment and nature for working children

CONCLUSION

The current study was performed because of the importance of working children and their social health and to assess the factors affecting their social skills. Previous studies show that the educational and care centers related to working children have failed to attract and persuade them to attend these centers as they should. Therefore, these centers need solutions to attract working children. In the meantime, knowing the user of the space can be very effective in decisions related to these individuals. A review of previous studies shows that one of the most important psychological and behavioral problems of working children is the deficiency in social skills, which also affects other aspects of their personality. Therefore, one of the things that should be considered in the design of the environment and spaces related to these children is that the environment has a suitable platform for social behaviors in order to improve social skills in working children.

In answering the first research question, which was: "What are the main demands of working children from a physical environment based on their social-behavioral patterns?" we realized that working children prefer spaces that have features of playability, a sense of security, environmental attractions, event-ability, proper furniture, curiosity about space, connection to nature, the breadth of vision and scenery, climatic comfort, a sense of belonging to a place and space flexibility. Also, in answering the second question of the research, which was: "Based on their moods and lived experiences, in what kind of environment do working children feel mental peace and can interact and communicate with others?" two factors of playability of the environment and connection to nature in spaces related to working children had the highest impact on the increase of sociopetaloid and duration of stay in these places in order to enhance social relationships. Extracted solutions and factors can be used in open, semi-open, and closed spaces according to the designer's decision.

There were some limitations in the current study regarding the understanding of working children by observing them. It was not possible to observe them for a longer period and follow their behaviors. Therefore, it is suggested that in addition to the observation method, other techniques such as interviews and psychological tests be used in future studies, which will definitely generate more accurate results. In addition, since the data analysis was interpretive and done by coding, the results may inevitably be influenced by researcher bias. Therefore, it is necessary to repeat the validity of the derived concepts of this research in other countries and with a larger number of children. Also, variables such as gender, level of education, and level of livelihood can affect the social behaviors of working children.

AUTHOR CONTRIBUTIONS

S. Emami designed the study, performed the literature review, collected initial data, analyzed and interpreted the data, and prepared the manuscript text and edition. S. Soleimani and B. Khorshidi Contributed to the research conceptual framework, controlled tasks, and provided good advice throughout the paper; they supervised the whole work and led the research in general. All authors have read and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the authors have witnessed ethical issues, including plagiarism, informed consent, misconduct, data fabrication or falsification, double publication and submission, and redundancy.

REFERENCES

Aghajani, T., Vakil Jabbarov, R., & Mustafayev, M. (2014). The effect of playing on children's social skills (Case of study: Preschool children in Tehran). *Journal of Iranian Social Development Studies*, *6*(3), 97-104. (In Persian)

Akbarzadeh, D., Hovida, F., Galegiroasan, N., & Mesrabadi, J. (2015). Comparison of social skill, impatience, and sleep problems among normal students and students with attention-deficit/hyperactivity disorder. *Studies in Medical Sciences*, *25*(12), 1067-1075. (In Persian)

Ali, N. (2011). The vulnerability and resilience of street children. *Global Studies of Childhood*, *1*(3), 260-264. https://doi.org/10.2304/gsch.2011.1.3.260

Ali, M., Shahab, S., Ushijima, H., & de Muynck, A. (2004). Street children in Pakistan: A situational analysis of social conditions and nutritional status. *Social Science & Medicine*, *59*(8), 1707-1717. https://doi.org/10.1016/j.socscimed.2004.01.031

Aptekar, L., & Abebe, B. (1997). Conflict in the neighborhood: Street and working children in the public space. *Childhood*, *4*(4), 477-490. https://doi.org/10.1177/0907568297004004007

Arghiani, M., & Shakeri, M. (2021). The Role of Built Environments in Student Interactions at School. *Armanshahr Architecture & Urban Development*, *13*(33), 1-14. (In Persian) https://doi.org/10.22034/aaud.2019.155800.1734

Athey, I. (2018). Contributions of play to development. In *Child's Play* (pp. 8-28). Routledge.

Bayat, M., Akbarsharifi, T., Jeirani, M. N., Shahrivar, Z., & Haghani, H. (2006). Behavioral problems of children at age of 7-11 years old in foster care centers. *Iran Journal of Nursing*, *19*(46), 53-60. (In Persian)

Bouzendan, A. (2019). The effect of child-centered play therapy based on nature on attention and aggression of children with Asperger disorder (a single case study). *Journal of Pediatric Nursing*, *5*(3), 59-67.

Connolly, J. A., & Doyle, A. B. (1984). Relation of social fantasy play to social competence in preschoolers. *Developmental psychology*, *20*(5), 797.

Daneshpour, A., & Charkhchyan, M. (2007). Public spaces and factors affecting collective life. *The Monthly Scientific Journal of Bagh-E Nazar*, *4*(7), 19-28. (In Persian)

Davoudi, I., Kascani, R. M., & Honarmand, M. M. (2014). Social skill, life satisfaction and locus of control in normal-hearing and hearing-impaired students. *Audiology*, *23*(2). (In Persian)

Dudek, M. (2005). *Children's spaces*. Routledge.

Fassa, A.G., Facchini, L.A., Mór DallAgnol, M., Christisni, D.C. (2000). Child Labor and Health: Problem and Perspectives. International Journal of Occupational and Environmental Health, 6 (1): 55-62.https://doi.org/10.1179/oeh.2000.6.1.55

Ferguson, K. M. (2005). Child labor and social capital in the mezzosystem: family-and community-based risk and protective factors for street-working children in Mexico. *Journal of Social Work Research and Evaluation*, *6*(1), 101.

Ghalambor Dezfuly, M., & Naghizadeh, M. (2014). Urban Design in the Context of Social Interaction Enhancement (Case Study: Street between Neighborhoods). *Hoviatshahr*, *8*(17), 15-24. (In Persian)

Green, K. D., Forehand, R. L., Beck, S. J., & Vosk, B. (1980). An assessment of the relationship among measures of children's social competence and children's academic achievement. Child Development, 51(4), 1149–1156.

Ghorbani Param, A. (2022). Designing a social and educational form and environment for child labor in Tehran's 22 district. *Sociological Studies of Youth*, *13*(46), 85-104. (In Persian) https://doi.org/10.22034/ssyj.2022.1953082.1233

Herrington, S., & Lesmeister, C. (2006). The design of landscapes at child-care centres: Seven Cs. *Landscape Research*, *31*(1), 63-82. https://doi.org/10.1080/01426390500448575

Hojat, I., & Shahhosseini, S. (2018). Redefinition of children's play space Based on evaluation and analysis of their needs from play space with enhancing creativity approach. *Journal of Conservation and Architecture in Iran*, *8*(15), 41-58. (In Persian)

Hosseini, H. (2006). The Conditions of work and street children in Iran. *Social Welfare Quarterly*, *5*(19), 155-174. (In Persian)

Hughes, F. P. (2021). *Children, play, and development*. SAGE publications.https://doi.org/10.1007/978-94-007-6579-5

Kathuria, T., & Kumar Pandya, A. (2020). Listen, I am too responsible! Effect of schooling on sense of trust, responsibility, and belongingness to the community of children working on the street in Chandigarh City, India. *JCYSR, 119* (2020) 105527. https://doi.org/10.1016/j.childyouth.2020.105527

Khan, S., & Hesketh, T. (2010). Deteriorating situation for street children in Pakistan: a consequence of war. *Archives of disease in childhood*, *95*(8), 655-657. https://doi.org/10.1136/adc.2009.178046

Khodabakhshian, M., & Taghizade, S. (2020). Guidelines for Designing an Effective Learning Complex for Child Labors (Case Study: City of Isfahan). *International Journal of Architecture and Urban Development*, *10*(3), 13-24. (In Persian)

Khoramshad, M. (2019). Preparation principle for Mohallah Playground Design, With Emphasis on Revival of Irainian Native Games; Case Study: Mohallah of Bagh-feyz in Tehran. *Iranian Islamic City Studies*, *36*(36), 23. (In Persian)

Lewis, Jill Boucher, Laura Lupton, Samantha Watson, V. (2000). Relationships between symbolic play, functional play, verbal and non-verbal ability in young children. *International Journal of Language & Communication Disorders*, *35*(1), 117-127.

Lerup, L. (1972). Environmental and behavioral congruence as a measure of goodness in public space: The case of Stockholm. *Ekistics*, 341-358.

Lillard, A. S. (2017). Why do the children (pretend) play? *Trends in Cognitive Sciences*, *21*(11), 826-834. https://doi.org/10.1016/j.tics.2017.08.001

Maas, J., Verheij, R. A., Groenewegen, P. P., De Vries, S., &

Spreeuwenberg, P. (2006). Green space, urbanity, and health: how strong is the relation? *Journal of epidemiology and community health*, *60*(7), 587.

Matlabi, G., Zarghami, E., & Saadat Vakhar, P. (2018). The Role of Open Space Legibility in Creating Social Interactions in Residential Complexes. *Iranian Architecture and Urbanism*, *9*(16), 139-156.

McDevitt, T. M., Ormrod, J. E., Cupit, G., Chandler, M., & Aloa, V. (2012). *Childdevelopmentandeducation*.PearsonHigherEducationAU.

Among empathy, social competence, & reactive/proactive aggression subtypes. *Journal of youth and adolescence*, *36*, 787-798.

Moradi, A., Sajjadi, H., Mohaqeqikamal, S. H., Vameqi, M., Hosseini Teshnizi, S., & Qaedamini, Q. R. (2016). A study of labor children's social health referring to non-govermental organization in support of children's rights in Tehran in 2014. *Journal of Rafsanjan University of Medical Sciences*, *14*(11), 977-988. (In Persian)

Norðdahl, K., & Jóhannesson, I. Á. (2015). Children's outdoor environment in Icelandic educational policy. *Scandinavian Journal of Educational Research*, *59*(1), 1-23. https://doi.org/10.1080/00313831.2013.821091

Newland, L. A., Roggman, L. A., & Boyce, L. K. (2001). The development of social toy play and language in infancy. *Infant Behavior and Development*, *24*(1), 1-25. https://doi.org/10.1016/S0163-6383(01)00067-4

Pasalar.celen (2003). The effects of spatial layout on students interactions in middle schools: Multiple case analysis. Unpublished thesis for degree of Doctor of Philosophy faculty of North Carolina State University.

Pellenq, C., Gunn, S., Lima, L. (2021). The psychological health and well-being of children working in the brick industry: A comparative study. *JSS, 140* (2021) 105251. https://doi.org/10.1016/j.ssci.2021.105251

Rashidian, A., Karimi-Shahanjarini, A., Khosravi, A., Elahi, E., Beheshtian, M., Shakibazadeh, E., ... & Zakeri, M. R. (2014). Iran's multiple indicator demographic and health survey-2010: Study protocol. *International journal of preventive medicine*, *5*(5), 632. (In Persian)

Soleimani, S., Molanaei, S., Khorshidi, B., Nedaei, C., & Ghamari, H. (2024). Investigating the Conceptual Model of Child–Nature Interaction in Architectural Spaces Using Grounded Theory. *HERD: Health Environments Research & Design Journal*, *17*(2), 200-226. https://doi.org/10.1177/19375867231207846

Stuart, G.W.,& Sundeen, S.J.(1995).Principles and Practice of Psychiatric Nursing. Fifth Edition, St.Louis: Mosby.

Subramanyam, Y. S. (2016). Child porters: Psychosocial profile of street children. *The Indian Journal of Social Work*, *51*(4), 577-582.

Tabarsy, B., M. A. Cheraghi, S. H. Pashaeypoor, and S. A. Sadat Hoseini. (2017) A concept analysis of self-concept in street child laborers." *Iran Journal of Nursing* 30, no. 109: 54-66. (In Persian) http://dx.doi.org/10.29252/ijn.30.109.54

Tabatabaian, M., Abbasalizadeh Rezakolai, S., & Fayaz, R. (2017). The Effect of Natural Environment on Children's Creativity. *Armanshahr Architecture & Urban Development*, *9*(17), 91-102. (In Persian)

Taylor, A. F., & Butts-Wilmsmeyer, C. (2020). Self-regulation gains in kindergarten related to frequency of green schoolyard use. *Journal of environmental psychology*, *70*, 101440. https://doi.org/10.1016/j.jenvp.2020.101440

UNICEF (2001). A study of street children in Zimbabve. Retrieved from https://www.unicef.org/evaldatabase /index_14411.html

Vameghi, M., Dejman, M., Rafiey, H., & Roshanfekr, P. (2015). Rapid Assessment of Tehran's Street Children Situation, 1393: Factors and Risks of Children's Street Working. *JQSSRI*, *4*(1), 33-57.

Ward, C. L., & Seager, J. R. (2010). South African street children: A survey and recommendations for services. *Development Southern Africa*, *27*(1), 85-100. https://doi.org/10.1080/03768350903519374

World Food Program, United Nations Children's Fund, and United Nations Office for Drug Control and Crime Prevention (2001), Rapid Situation Assessment Report on the situation of street children in Cairo and Alexandria, including the children's drug abuse and health/nutritional status, Cairo.