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Redefining The Space Through Play

Interpreting Child's Experience in Primary Schools Through a Comparative Analysis of Interfacing Spaces

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ABSTRACT

Child-space interaction is fundamental for experiencing and learning the environment and it first occurs in kindergartens and then in primary schools, where children explore more freely by spreading to wider boundaries than home. Beside their daily experiences, the most effective activity for the child to experience school is play. In addition to learning of the space by play, these spaces are reproduced and interpreted with the child's imagination throughout the play. On this basis, the indoor and outdoor spaces and their interfacing spaces in a school structure have a key role.

In this framework, this study aims to examine the relation between the spatial configuration and the child's use of space within the scope of indoor-outdoor interfacing spaces. The field studies were carried out in two primary schools in Istanbul-Turkey, which have the same education model but are differentiated in terms of the configurative characteristics of their indoor-outdoor interfacing spaces. Analyzed data is collected based on perception, experience, and remembering. These interfaces were analyzed according to visibility and knee level accessibility possibilities. The syntactic data, usage and remembering frequencies of interfaces, and play variety were all interpreted by regression analysis.

In conclusion, the correlations through conducted data at indoor-outdoor interfaces with different characteristics in both schools showed that visibility and knee level accessibility between indoor and outdoor spaces as well as the morphology of spaces in terms of its geometry affect the use of the space. Therewithal, children's recall of spaces, their activities in spaces, and the way they reproduce the space through play are also related to the configuration of the space.

KEYWORDS

Primary schools, Perception, Experience, Children, Play

1 INTRODUCTION

School supports the development of the individual theoretically, physically and socially. Especially in childhood, kindergartens and primary schools are the places where the individual spends the most time after home. Compared to kindergarten, the child has the opportunity to explore the primary school spaces more freely. In this respect, primary school is a new place where the child experiences, learns and establishes social relations outside of the home environment. For this reason, the spatial perception of the child, who is in the age of both physical and psycho-social development, and the relationship she/he establishes with the place cannot be considered separately from the spatial organization of primary school buildings. The configuration of the space and indoor-outdoor relationships also affect the child's perceptual-cognitive-behavioral processes and interaction with other children.

This study focuses on indoor and outdoor relations in primary school buildings. Within the scope of the study, the parts of these spaces between indoor and outdoor spaces are defined as transition spaces, indoor-outdoor interfaces. Differences in the configurations of indoor-outdoor interfaces bring about significant changes in children's perceptions and experiences in these spaces. In addition to the daily experiences of the child in the process of exploring and experiencing these places, play is also an important activity. At the same time, the child coexists and interacts with other children through play. In this respect, play is also effective in establishing social relations in addition to the relationship between the place and the child. In addition to her/his daily experiences in primary school, the children mostly stay together while playing, interacts with other children and become a part of the social environment they are in.

The reinterpretation of the designed space by the child brings about the reproduction of these spaces by the child. Play is closely related to the child's perception of space, thus cognitive and behavioral processes, who experience, reproduce and learn the space through play. The spatial configuration also affects the child's play production. This is also a feature that determines the game-generating potential of the space itself. In this study, the effect of a place on the playability of different games is defined as the game production potential of the place. In other words, the potential of the space to produce play is related to the morphology of these spaces as well as the endless imagination of the child. For example, a space with elements such as columns, stairs, and walls has different usage and play potentials, while a completely open space has different usage and play potentials. In addition, the relations between spaces and the indoor-outdoor interface space configuration determine the child's use and remembering as well as the play-producing potential of spaces within the scope of the child-space relationship. Likewise, visual and knee-level accessibility potentials of interfaces are effective on usage, play activity, and perception-

remembering in primary school spaces. In this context, the main question of the study is based on the relationship between eye-level and knee-level accessibility features of how children set up their activities in indoor and outdoor interfacing spaces.

Cabadak (2019) examined the effect of permeability and visibility on user interaction in interior and exterior interfaces within the scope of architecture faculties. As a result of this study, it is seen that human activities in transition spaces are more affected by visibility rather than permeability. Cabadak defines the term eye-level accessibility with the term visibility and knee-level accessibility with the term permeability used by Koch (2012). It can also be seen in studies as knee-level accessibility walkability (Ren & Hou, 2019). In this study, the terms visibility and knee-level accessibility are used for different access possibilities for children. In this context, the visibility level for the child was determined as 100 cm, and the knee height for the knee level accessibility was determined as 30 cm.

In this framework, this study aims to examine the relation between the configuration of the space and the child's use of space within the scope of interfacing spaces of indoor and outdoor. In this study, the relationship between the spatial organization and social structure in the space syntax theory put forward by Hillier and Hanson (1984), which forms the conceptual basis of the study, is examined within the framework of child, play, primary school indoor-outdoor interfaces. The perception of space and the development of cognitive processes along with the development of the person have been discussed in many studies (Piaget, 1960; Piaget and Inhelder, 1969; Hart & Moore, 1976). The primary school space, on the other hand, contains different possibilities for the child to establish spatial relations in the cognitive development process. In this context, the concept of interior and exterior, the experience of being inside and outside, and the re-establishment of new space between this experience with play also determine the method of fieldwork. In this respect, the perception, remembering, and play activity in space are key terms. The relationship of these terms are examined with the syntactic analysis of the space, cognitive and behavioral maping studies.

Children's recalling process, their activities in spaces, their relations with the other children, and the way they reproduce the space through play are also related to the configuration of the space. In this study, the spatial configuration of the interfacing spaces with different characters and the changing visibility and knee-level accessibility features are discussed in terms of children's usage, remembering of space, and play experiences.

2 METHODOLOGY

In this study, it is critical to determine only the schools with differences in space configurations so that the indoor and outdoor relations can be analyzed. Therefore, two primary schools were determined in Istanbul-Turkey, which have the same education model but are differentiated in terms of the configurative characteristics of their indoor, outdoor, and interfacing spaces.

Educational structure being same helps that the attitude of the teacher and the students' classroom and extracurricular activities have similar characteristics. Thus, it is considered important in the analysis of space relations. The fieldwork is structured in two main axes as space-space relationship and space-human relationship. While examining the space-space relationship, the interior and exterior interfaces of schools are dismantled.

The focus groups of the field study are; the first grades who are starting to explore their cognitive development and school for the first time, and second grades who are more experienced but in a similar developmental process. In this context, the age range of the focus group includes children aged 5 and 6 who are the age of starting primary school and children aged 7 who are in second grade in Turkey. At the same time, field study has spatial and temporal boundaries. In both primary schools, the spaces available to first and second grade students form the spatial boundaries of the field study. It is the temporal determinant of the study that the study covers extracurricular free time in order to monitor the child's leisure time activity. The subject of both observation and cognitive mapping is carried out within these limits.

For indoor-outdoor access potentials at these interfaces, the features of space syntax theory developed by Hillier and Hanson (1997) for the representation and analysis of spatial relationships are applied. The syntactical properties of the interfaces are obtained with the Syntax 2D software developed by the University of Michigan. In this framework, a comparative analysis of the visibility and knee-level accessibility potentials of the interfaces is made. In these analysis, spaces are evaluated within the scope of isovist area, isovist perimeter, integration, mean depth, connectivity, circularity, compactness, and openness data. The space-human relationship is examined with the use of children in these spaces and their level of remembering. In this context, all these data are obtained in three different ways. These are;
- obtaining syntactic values of interfaces,
- determination of children's behavior in these places by observation
- to obtain the level of remembering these places of children with cognitive map study.

In this context, the syntactic values of the interfaces, interior-exterior visibility, knee-level accessibility, and the relationship between space usage and recall levels are examined by regression analysis.

2.1 Determining the Thresholds

As stated in the previous section, field study was carried out in two primary schools affiliated with the İstanbul Technical University Foundation for the Development, which have the same educational structure. Before the field study, the space and interface relations of both schools are discussed within the scope of the configurations of the spaces and indoor-outdoor relations.

I.T.U. BEYLERBEYI PRIMARY SCHOOL

Foundation for the Development of I.T.U. Beylerbeyi Primary School is located in the Beylerbeyi district of Istanbul, within a dense residential pattern. In the school building, which is located on a sloping land, indoor and outdoor uses are designed at various levels. The relations of the spaces with each other are provided by long corridors. In I.T.U. Beylerbeyi Primary School, the spaces were planned according to grade levels during the design stage, and the use of indoor and outdoor spaces was separated according to age groups.

In the field study, floor plans with elevations of +80.00 and +84.00, which are open to first and second grades' use, were discussed. In this context, there are workshops, first and second grades' dining hall, gym, teacher's rooms in the interior at +80.00 level. At the same time, access to the first grade's garden from this level is provided through the workshop and cafeteria corridors.
At the +84.00 level of Beylerbeyi Primary School, there are first and second grades' classrooms, dining hall, teacher's rooms, laboratories, and administrative units. Access to the +84.00 level garden on this floor is provided from the second grade classrooms' corridor and the area where the administrative unit is located. On this floor are also the laboratories of the fourth and older classes. The corridor, where the laboratories are located, is used as the free-time space of the fourth grade. On this floor of the school, first and second grade students do not use the laboratory section. There is an invisible border, although not physical.

Figure 1: Beylerbeyi Primary School +80.00 level's interfacing spaces (above), Beylerbeyi Primary School +84.00 level's interfacing spaces (middle), Ayazağa Primary School interfacing space (below).

I.T.U. NATUK BİRKAN-AYAZAĞA PRIMARY SCHOOL

Foundation for the Development of I.T.U. Natuk Birkan-Ayazağa Primary School is located in the Ayazağa campus of Istanbul Technical University. For this reason, it differs from the other school in terms of its location and the relationship it establishes with its environment. In addition, it has a more central plan scheme compared to the school in Beylerbeyi. This school is different from Beylerbeyi in terms of indoor and outdoor relations. There are two different levels of gardens here. The field study was carried out at +90.00 elevation, which only the first and second grades can use in their free time. Here, there is the main entrance hall, first grades' classrooms, common use area, administration room, and library. Indoors, the 1st and 2nd grades' spaces are more free than in Beylerbeyi. At the same time, the gallery-spaced plan scheme of the school contains potentials in terms of visuals and usage.

2.2 Defining spatial properties and interfaces' thresholds

Evaluating the spatial characteristics and boundaries of both schools as a whole is important for understanding the indoor-outdoor interface relations. While corridors are dominant connecting points within the interior space in Beylerbeyi, there is a distribution from a single space to the classroom corridor in Ayazağa. These interfacing spaces, which have the characteristics of transition spaces in Beylerbeyi, allow both entrance/transition and gathering/dispersal in Ayazağa. At the same time, these spaces are used by children intensively and in various ways. In addition, since the visual accessibility between floors is higher in Ayazağa than in Beylerbeyi, it can be said that the school in Ayazağa is more accessible and holistic, visually compared to Beylerbeyi (Figure 1, Figure 2).

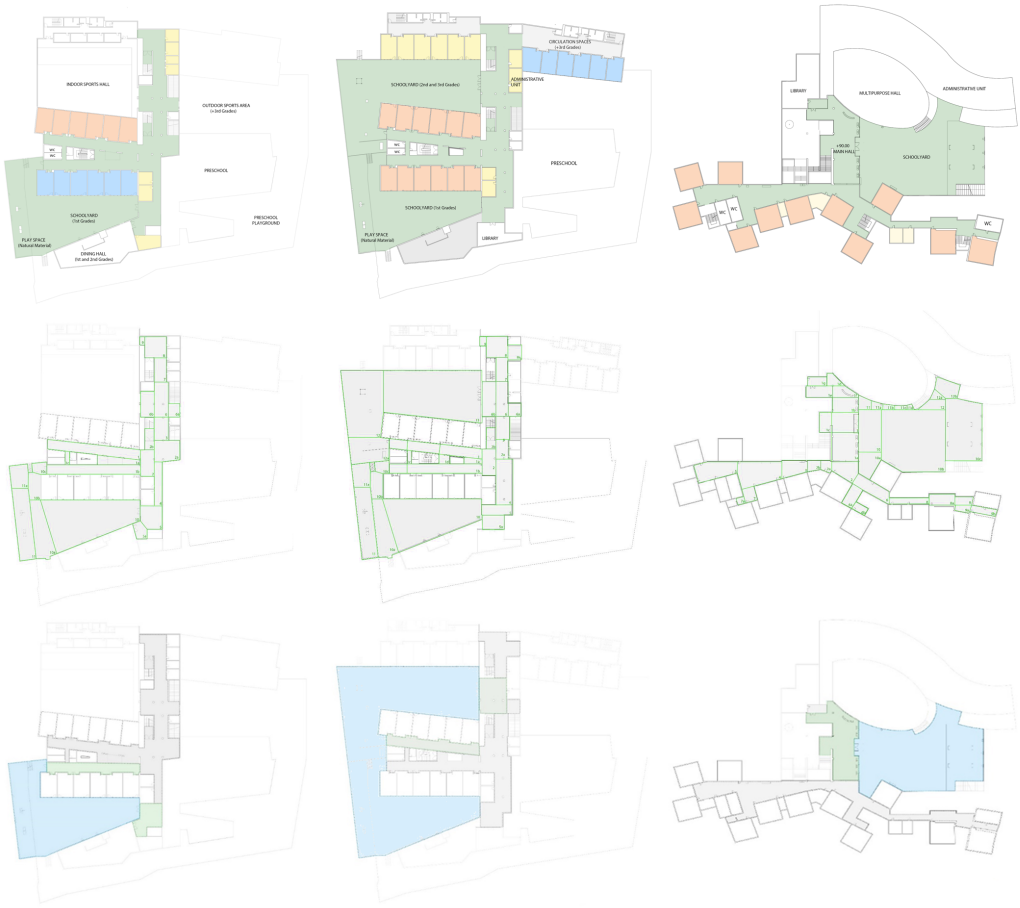

Figure 2: Top to bottom schools' space groups, convex spaces and their interfaces (gray: indoor spaces, green: interfacing spaces, blue: outdoor spaces); From left to right Beylerbeyi +80.00, Beylerbeyi +84.00 and Ayazağa Primary School.

The school plans divided into convex spaces and are separated into the inside, outside, and inside-outside interfaces according to the interface groups, and the connections between them are shown with these graphics. From this, it can be read that while there are different transition spaces between indoor and outdoor spaces in Beylerbeyi, there is only one interface space in Ayazağa (Figure 1, Figure 2).

These interface spaces are divided into two subgroups in terms of both their configurations and the visual relationship they establish with the exterior. The first group defined as X1 is only found in the school in Beylerbeyi. The connection of X1 interface, which has the characteristics of a corridor, with the outdoor accessibility is provided by the door. At the same time, it has weaker visual permeability and is more directive. The X2 interface is available in both Beylerbeyi and the school in Ayazağa. This interface shows the feature of meeting/dispersal space in terms of space scheme. The indoor-outdoor visual transparency of the X2 interface is also higher than that of the X1 interface. While the X2 interface is visually associated with other spaces and floors at the school in Ayazağa, it only provides visual access between indoor and outdoor spaces in Beylerbeyi (Figure 3).

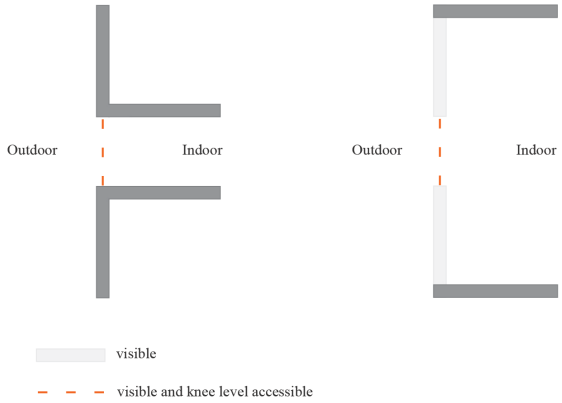

Figure 3: X1 (left) and X2 (right) interface groups according to indoor-outdoor eye level and knee level accessibility relations.

3 DATASETS AND METHODS

The field study is carried out in three stages, during which syntactic data is obtained, observation and cognitive mapping. Thus, the features coming from the space itself and the human relationship can be read in terms of space-experience-remembering. Since the observation and cognitive mapping study focuses on the space-individual relationship, this study was carried out with first and second grade students who use similar space groups in the participant profile. Another reason for choosing two different grade levels is that first-grade children have just started to experience the school on their own, while second-grade students have the opportunity to experience the place more. At the same time, the fact that their developmental processes are close to each other in terms of their age is one of the primary reasons for choosing the two grade levels.

3.1 Data extraction

The visibility-based and knee-level accessibility-based spatial relationships in both schools were read with the analyses made in the Syntax 2D program. In these analyses, the isovist area, integration, mean depth, connectivity, circularity, compactness, and openness values of the space mentioned in the space syntax theory were taken into account (Hillier & Hanson, 1984).

The integration value gives information about the relationship of spaces with each other, whether the space is shallow or deeper. The connectivity value is directly proportional to this value and gives information about the access between the cells that create space. Both integration and connectivity values are considered important for reading indoor-outdoor interface relations. At the same time, these values show the intelligibility feature of the space. The compactness value, which is defined as minimizing the metric or modular distance of all spaces to each other in any arrangement, is inversely related to circularity and is related to the distance of the walls of the space to the center (Hillier, 1996). According to the circularity value, which gives information about the distance of the visibility point to the center as well as the centrality of the space, the more central the visibility point is, the higher the cyclicity value (Şalgamcıoğlu, 2013).

Çanakçıoğlu (1996) states that in a study of educational buildings, spaces with high compactness value give an idea about the feature of being passed. According to the study, while places with low circularity and high compactness values have the feature of being passed through, time can be spent for a long time in spaces with the opposite feature. The isovist area and isovist perimeter analyses obtained in the study are used to examine the openness value. The openness value calculated by the ratio of the periphery of the isovist view field to the isovist view area can give an idea about the space-human relationship (Franz & Wiener, 2008). In Kaplan's (1989) study on space preference, the openness value is defined as the space criterion that the observer can perceive. For this reason, the openness value is important for the relationship between the quality of the space and the children's cognitive-behavioral processes.

The observation study was carried out with the naturalistic observation method in order to determine the daily routines of the students in these spaces. Thus, no outside interventions were made to the school experiences of the students, and their daily experiences and relationships were recorded in the behavioral maps. This study was carried out in the spaces used by first and second grade students in both schools, three days a week for 40 minutes at lunch break. Since exploration behavior and play activity have an important place in terms of understanding/learning the place, field study focuses on the experience of space in free time (outside of class hours). In order to examine the interface relations in a comprehensive way, the observation study was carried out not only in the interface spaces but also in all spaces that have an indoor-outdoor relationship and can be used by selected grades. As a result of the observation study, repetitive behavior modes were determined and processed on the convex spaces on the map. In the analysis, the frequency of use of the space obtained from these behavior modes and the frequency of play production, which shows the variety of children's games, are used.

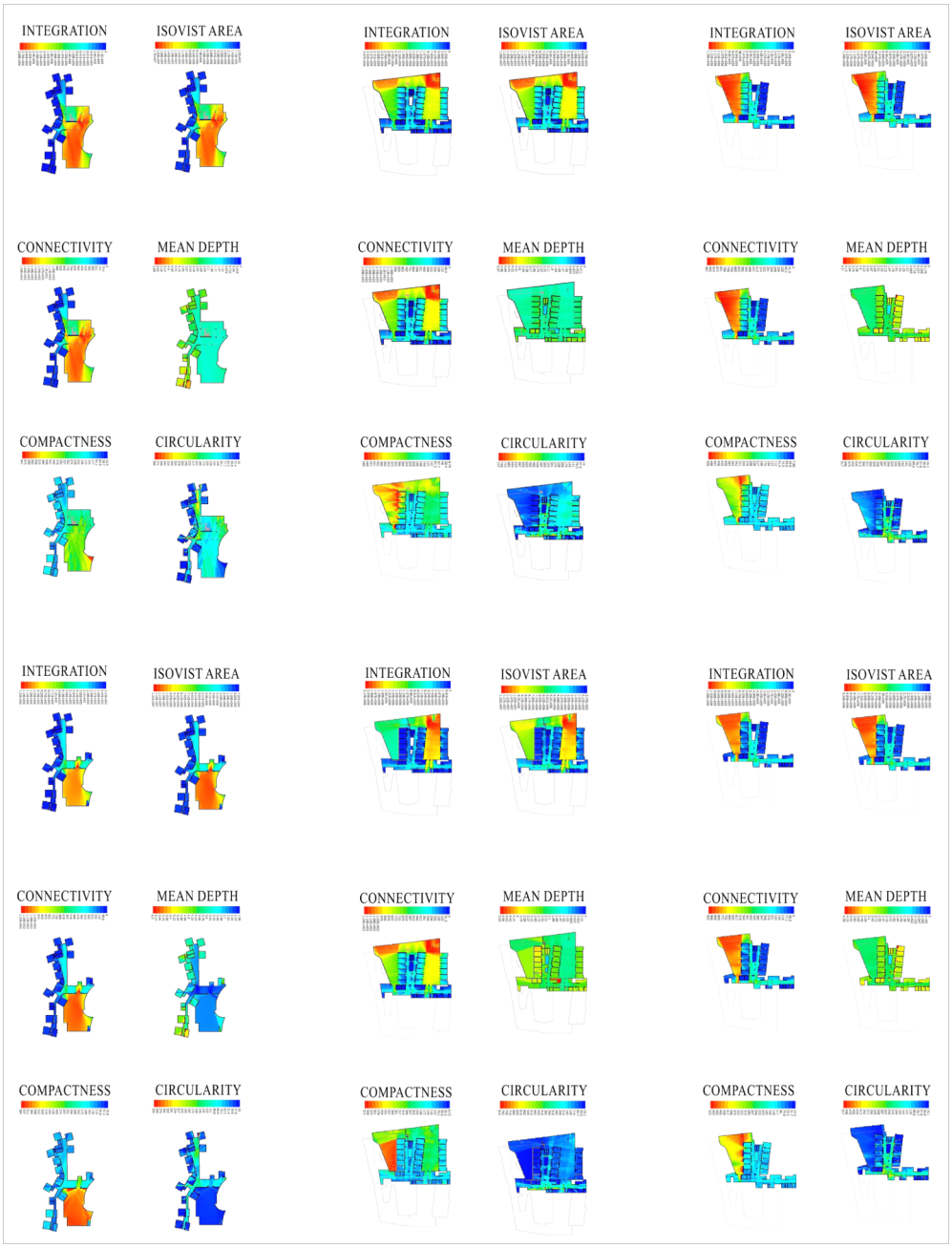

Figure 4: Syntax 2D analysis graphics; on visibility basis (left), on accessability basis (right); ITU Beylerbeyi +80.00 (above), ITU Beylerbeyi +84.00 (middle), ITU Natuk Birkan (below) (all values increase from blue to red).

Cognitive maps were combined with observation data and syntactic data. Thus, the relationships of children in interface spaces can be examined multidimensionally. A total of 109 students from both schools participated in the study. Distribution of participants, a total of 59 students, 34 of whom are first grade and 25 of whom are second grade, from the Foundation for the Development of I.T.U. Beylerbeyi Primary School; a total of 50 students, 33 of whom are first grade and 17 second grade students, from the Foundation for the Development of I.T.U. Ayazağa Primary School. Cognitive mapping was carried out after the observation was completed in order to make the observation more objective. As this study will be compared with the observation

data, it was carried out with a 30-minute painting work done during the visual arts lesson hours themed “Draw your journey at school during your lunch break”. Visual data collected with cognitive maps were decomposed by visual content analysis. In the visual content analysis, firstly, subgroups were formed, and the pictures were examined according to the elements in these subgroups. From the content obtained in the analysis, it was mainly focused on the frequency of showing on the map. Thus, the relationship between usage, remembering, and the morphology of the space can be read with a three-stage study (Figure 5).

		BEYLERBEYİ +80.00 X1	BEYLERBEYİ +80.00 X2	BEYLERBEYİ +84.00 X1	BEYLERBEYİ +84.00 X2	AYAZAĞA / NATUK BIRKAN
Visibility	Isovist area	3.037.772.520.554	3.223.226.085.042	3.565.265.403.499	6.791.844.501.084	14.315.959.136.153
	Isovist perimeter	23.460.788.215	14.726.717.534	29.826.255.812	40.785.580.331	46.500.887.151
	Openness	181.188.216	67.657.711	249.520.144	246.091.534	153.286.152
	Integration	383.088.742.793	397.364.991.720	717.967.123.259	1.472.124.047.908	2.438.960.580.064
	Mean depth	2.066.380	2.291.041	2.092.091	2.035.465	1.937.981
	Connectivity	321	331	359	679	1.420
	Circularity	183.009.554	78.669.726	256.376.172	266.837.335	154.769.264
	Compactness	129.715.267	220.782.321	118.210.505	162.471.906	309.701.966
Accessability	Isovist area	2.748.193.036.727	2.734.767.024.460	2.799.761.859.082	6.441.304.520.003	4.090.230.782.702
	Isovist perimeter	21.838.718.599	14.200.128.997	21.602.792.195	36.656.752.627	16.602.120.698
	Openness	173.542.988	77.191.199	166.685.830	210.449.510	74.249.771
	Integration	318.426.025.812	303.485.579.187	422.130.634.145	1.101.544.855.073	432.434.088.289
	Mean depth	2.133.707	2.329.630	2.309.012	2.219.426	2.492.893
	Connectivity	292	274	280	648	409
	Circularity	175.011.749	92.714.595	168.841.275	229.812.718	76.610.432
	Compactness	126.004.193	178.722.669	130.443.550	172.476.471	231.298.184
Usage frequency		24	3	22	12	201
Remembering frequency		4	7	13	9	18
Play production frequency		5	1	6	3	24

Figure 5: Visibility and knee level accessibility graph values of interfaces in schools and usage, remembering, and play production frequencies obtained by observational and cognitive mapping.

Finally, in order to evaluate all the data obtained, a correlation analysis is performed between the syntactic data in the interfaces focused on the scope of the study and the usage, play activity, and recall frequency values. IBM SPSS program is used for analysis. Accordingly, relationships are interpreted as sensible or non-sensible depending on p-value less than or equal to 0.05 ($p \leq 0.05$), and R-value that is in between +1 and -1 in the analyses which shows inversely proportional (if $R < 0$) or directly proportional (if $R > 0$).

4 RESULTS

The relationships obtained by the correlation analysis of the syntactic data from the configuration of the interface spaces and the semantic data obtained as a result of the use of the space are interpreted in this section. In this context, before the correlation analysis, the syntactic values of the interfaces and the relations of the semantic data with each other are evaluated separately.

4.1 Results of Observational and Cognitive Datas

According to observation and cognitive mapping studies, the play variety of the interface in Ayazağa has a higher frequency in terms of usage and recall (Usage frequency: 201; Remembering frequency: 18; Play production frequency: 24). In this case, it is effective that it is the only interfacing space used by students. Looking at Beylerbeyi, it is seen that the X1 interface is used more on both floors (Usage frequency +80.00, X1:24 X2: 3; +84.00, X1: 22, X2: 12). This situation suggests that the corridor plan scheme is due to the guiding effect on the students.

Likewise, more diverse games are played by the children at the X1 interfaces on both floors (Play production frequency +80.00, X1:5 X2:1; +84.00, X1:6 X2:3). On the other hand, while the X2 interface is remembered more at +80.00 level, the X1 interface is remembered more at +84.00 level. Considering that there are first and second grades' dining halls at the X2 interface at the +80.00 level, and the first and second grades' corridors at the X1 interface at the +84.00 level, it can be said that spatial functions may also be effective in remembering.

4.2 Interpretation of Syntactic and Semantic Data

According to the Space Syntax analyses, it is possible to interpret the interface relations in both schools. Considering the asymmetry between visibility and knee-level accessibility in the interfaces of both schools, there is not much difference in Beylerbeyi, while there is the highest level of asymmetry in Ayazağa. There is a high level of asymmetry in Ayazağa is caused by the fact that the permeability of the interface here is visually higher than the interfaces in other schools, while students have access to the outside space with a single door. It is thought that this situation also affects the behavior of the students in the place. In this context, correlation analysis of syntactic and semantic data gives information about interface-space and child-space relations. In the visibility analysis of the X2 interface at +80.00 elevation in Beylerbeyi, the isovist area, integration, connectivity, mean depth, and compactness values are higher than the X1 interface.

When the accessibility analysis is examined, it is seen that these values are higher in the X1 interface than in the X2 interface, except for compactness and mean depth. The fact that the openness value is higher in the X1 interface at eye-level and knee-level than in the X2 interface draws attention in terms of the perceptibility of the space with the corridor scheme. At the same time, it can be said that there are shallower spaces than the X1 interface in terms of eye-level and knee-level accessibility between the exterior and the X2 interface. The higher circularity value in the X1 interface indicates the spatial relationship between the interface and the configuration of the entire space (Figure 4, Figure 5). There are some important results as a result of the correlation analysis between the syntactic values of the interfaces in this layer and the child-space relationship (Figure 5, Figure 6). These are: R=0.997, p=0.049 (isovist area-remembering frequency / knee-level accessibility based result), R=1, p=0.011 (connectivity-remembering frequency / knee-level accessibility based result), R=0.999, p =0.025 (integration-remembering frequency / knee-level accessibility based result) and R=0.997, p=0.048 (usage frequency-play production frequency result).

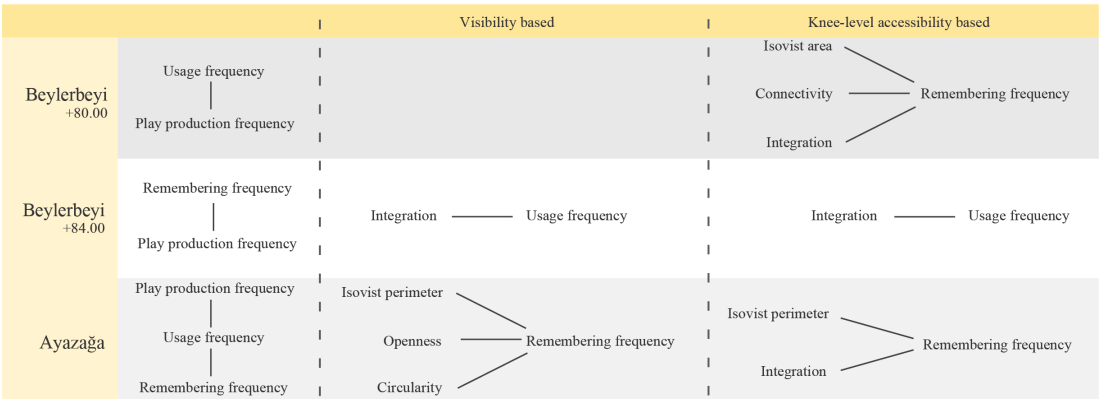

Figure 6: Syntactic data, usage, remembering, and play production frequency correlation diagram according to visibility-based and knee level accessibility-based analyses.

In Beylerbeyi +84.00 elevation syntactic analysis, the X2 interface is shallower than the X1 interface in terms of both eye-level and knee-level accessibility. It is seen that the circularity value is higher than X1 in the X2 interface. The openness value on this floor is higher in the X1 interface in the eye-level accessibility analysis, and lower than X2 in the knee-level accessibility analysis (Figure 4, Figure 5). This shows that the perceptibility of this floor has changed in terms of visual and knee-level accessibility. Important results on this floor: R=-0.999, p=0.022 (integration-usage frequency / visibility based result), R=-1, p=0.011 (integration-usage frequency / knee-level accessibility based result) and R=0.999, p=0.033 (remembering frequency-play production frequency result) (Figure 5, Figure 6).

Looking at the school in Ayazağa, visibility graph values excluding mean depth are higher than knee-level accessibility values in the only interface with X2 interface features. According to the syntax graphs, it can be seen that the Ayazağa X2 interface has a high interaction potential in terms of both visibility and accessibility, and it is also connected with other spaces (Figure 4, Figure 5). In this context, it can be said that this space has a high potential in terms of intelligibility. Important results in correlation analysis between syntactic values of this interface and usage-remembering-play datas show: R=-0.799, p=0.031 (isovist perimeter-remembering frequency / visibility based result), R=-0.825; p=0.022 (openness-remembering frequency / visibility based result), R=-0.824, p=0.023 (circularity-remembering frequency /visibility based result), R=0.829, p=0.021 (isovist perimeter-remembering frequency / knee-level) accessibility based result), R=0.765, p=0.045 (integration-remembering frequency / knee-level accessibility based result), R=0.846, p=0.016 (usage frequency-remembering frequency result) and R=0.938, p=0.002 (usage frequency-play production frequency result) (Figure 5, Figure 6).

5 CONCLUSIONS

The indoor-outdoor interfaces in the schools were evaluated within the scope of the study. Also, the children's free-time experiences in these spaces were evaluated with syntactic and semantic

data. According to this evaluation, it has been seen that each interface space of the schools has different relationship dynamics in terms of use, remembering, and play activity.

Firstly, different relations are encountered in both of the interfaces defined in two different types in Beylerbeyi. Among these interfaces, it is seen that the X1 interface, which is in the corridor layout and has a weak visual relationship with the exterior, is used more by the students on both floors. Considering the syntactic and semantic data, it is seen that at the +80.00 level which is the usage space for the first-year students, the students remember more connected and accessible spaces in terms of knee-level based accessibility. Syntactic values and usage graphics of the interfaces on this floor show that the X1 interface, which is low in terms of visibility but high in terms of accessibility, is mostly used by students and more diverse games are seen in this space. At the same time, the X1 interface at +80.00 level is more directive than the X2 interface due to its proximity to the vertical circulation elements and its layout. For this reason, it can be said that the configuration of the space is dominant in the perceptual-behavioral processes of the first-year students who have just experienced the school.

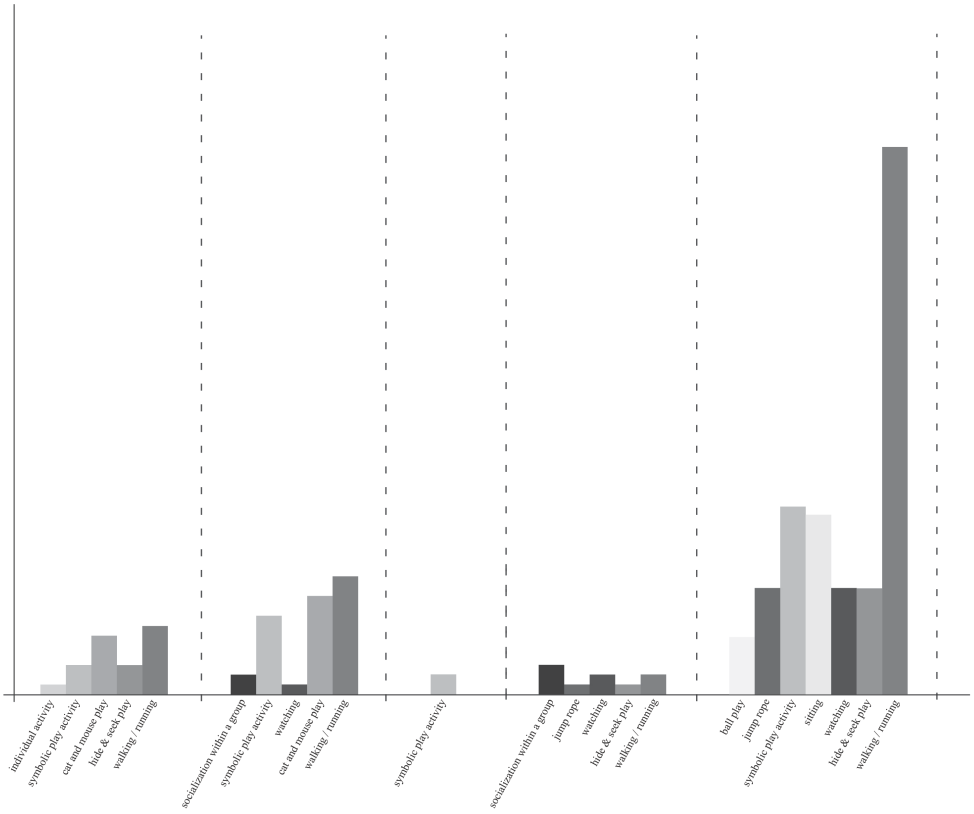

Figure 7: Activity/play type frequency distribution graph (From left to right: Beylerbeyi +80.00 X1 interface, +84.00 X1 interface, +80.00 X2 interface, +84.00 X2 interface, Ayazağa +90.00 X2 interface).

As can be seen in the table, the activities (individual activity-reading, walking/running) and play (symbolic playing, cat & mouse, hide & seek) in the X1 interface on this floor also vary compared to the X2 interface. The fact that the most common activity and play have running and passing through features shows that the configuration of the space may have an effect on the play

preference. It is seen that the hide and seek game in this space is played around visually restrictive elements such as columns and walls in the interface. At the same time, the stair halls, which are outside the scope of the evaluation, are also places where intense games are played. In this context, besides the space layout and indoor-outdoor relationship, spatial elements are also effective in helping children gain new meanings to these spaces with their imagination.

Beylerbeyi +84.00 level, which is a free-time space for second grade students, has different relations. The interfaces here show different properties within the scope of visibility and accessibility. On this floor, students use both visible and accessible spaces less. It is seen that the X2 interface, which has high indoor and outdoor visual connection, is used less. At the same time, this space is less remembered than the X1. In this case, a similar situation with the +80.00 level is seen here as well. Students use more directive spaces rather than more visually and knee-level accessible spaces. When we look at the behavior and play types of the students, walking/running behavior is seen intensely in the X1 interface, but the most played games are cat & mouse and symbolic play. While individual activity can be seen at the +80.00 level X1 interface, it is remarkable that students spend time in groups at the X1 interface on this floor. This suggests that as the time to experience the school and the environment increases, there may be a tendency from individual activities to group activities. On the other hand, the X2 interface at +84.00 level is less used than X1, but unlike X1, it is an interface where the hide & seek game is played. The appearance of the jumping rope on this interface indicates that it allows for a different type of activity than other interfaces (Figure 7).

At the same time, it is remarkable that the X1 interface, which is defined as weaker in terms of indoor-outdoor visual relationships, is more preferred by students. Although there is no significant result in the correlations, when looking at the table, it is seen that the visibility-based openness value is higher in the X1 interface on both floors. Accordingly, it can be said that children in Beylerbeyi prefer to spend time in more visually open and perceptible spaces. When the openness value and usage type of the space are evaluated within the scope of activity/play type, walking, running and cat & mouse games are seen the most. When the play type is evaluated, also shows that this space allows for dynamic use. When the X2 interface on both floors is evaluated, more stable activities and games such as chatting, hiding, symbolic play, and jumping rope are seen. In this context, it is seen that there may be a relationship between the openness value and the play type, although not all configuration features of the space are effective on the play type.

This situation offers a new perspective on the effect of the passing feature of the space on behavior and play. A contrast is observed in transition spaces (corridors) with the fact that the spaces with low circularity and high compactness values mentioned in Çanakçıoğlu's (1996) study. The study at this school shows the opposite situation.

In the interface with the X2 layout in Ayazağa, it can be mentioned that there are important relations between the space and the level of remembering. It is seen that this space allows for many more types of activities/plays. This is due to the more flexible planning of the space and the fact that it is the only interface between indoor and outdoor. Accordingly, in this interface, children are visually out of the center and not easily perceived; but in terms of access, they remember the places associated with their environments more. The fact that children remember more walkable and visible spaces questions the effect of the play experience. When the activity/play types in this space are evaluated, hide and seek and the symbolic games which are children construct with their own scenarios are the most played games. For this reason, although the diversity of the play is not effective in this interface, the play type is considered to be effective and important for children to remember the space. Considering the most played game type here, it is seen that children use the space layout to produce plays. Activities that require more static use of space such as sitting, standing, watching around, hiding, and jumping rope are seen at the perimeter of the space, while there are movement-based activities such as running, walking, ball games towards the center of the space. In this respect, relationship between circularity and use/play are questioned. In the study, it draws attention that remembering and circularity are inversely proportional, but more central spaces are used dynamically and peripheral spaces are static. Future studies show that the spatial relationship of the child's use of space, remembering levels, and the play she/he produces should be disassembled and its relationship with the spatial configuration may be examined in this context.

As a result of the study, the importance of the child's imagination and the process of reproducing the space is seen. The configuration of the space affects the child and her/his spatial behavior, and the child reconstructs these spaces with play and processes them in her/his memory. In the study of Sarıberberoğlu (2018) in secondary schools, she mentions that, contrary to what is thought, spaces with low interaction potential are used and remembered more. In this study, a similar result is seen in the usage areas of the second grades in Beylerbeyi. However, as seen in the interface in Ayazağa, the play behavior of children can change the usage scenario of the space. It can be said that the layout of the space affects the play scenarios of the children, as seen in both schools that are different in terms of both space configuration and indoor-outdoor interface relations. However, the space reconstructed by the individual or collective imagination is re-interpreted beyond the configuration.

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