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Playing children: Documenting autonomy-supportive space using an architectural-psychological method

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Abstract
Preschool children display their newly acquired autonomy during playtime by initiating creative play free from parental control. The development of autonomy requires encouraging environments physically as well as socially. However, how physical properties of play spaces affect children's autonomy is not well documented, partly because of the methodological difficulties involved in such fieldwork. Certain spaces may encourage or discourage autonomous behavior in children. The purpose of the study is to investigate how space can support children's autonomy during play using architectural visualization methods along with theory from the field of psychology. It focuses on the interaction between children, parents, and space and takes play as a medium of investigation through a series of workshops with children aged 3-6 years and their parents took place in the period of two months. Maps of play areas were created using architectural visual documentation techniques while children's play activities were analyzed with a pre-determined coding system. The observation of play activities suggested that children's concentration while playing is an important indicator of autonomy. It demonstrated that spatial arrangements define the distance between children and their parents, which in turn influences the children's concentration that is required for their autonomous play. Combining knowledge and techniques from the fields of psychology and architecture, the study documented how the space supports children's autonomy rather indirectly via its effect on parental proximity, while outdoor spaces with their rich environment instigate such autonomous behavior.

Keywords
Autonomy, Children, Play, Space.

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1. Introduction

Child development does not occur independently from the child's physical environment. The space where children live and play is not a mere backdrop of their development, but a vital facilitator of their early development. As an example, depth perception in infants is known to develop as they learn to crawl and explore space (Gibson & Walk, 1960). Likewise, children acquire a sense of autonomy through their experience of independent exploration of their environment (Bowlby, 1988). They strike a balance between taking risks and feeling secure under the supervision of parents (Erikson, 1963). In preschool years, children's mastery of autonomy and initiative becomes increasingly visible during play, as an essential component of their learning and development (e.g., Piaget, 1954; Vygotsky, 1978). Play is a stage in which children can fully realize themselves and express their true selves (Agamben, 1993). Children's play can occur spontaneously anytime and anywhere, beyond the assigned spaces such as playgrounds. Even intervals between basic activities such as sleeping, toileting, and eating can be used as moments of play as long as the child intends to do so. While playtime supervision is essential for toddlers and preschool children, the physical conditions of play spaces influence the nature of this supervision. The more spatially distant the parents are, the fewer children depend on parental approval, and thus, they will be better able to concentrate on play. However, the way space serves as a context for play is not only limited to this and warrants further examination.

This paper dwells on the relationship between the spatial settings and children's autonomy. Autonomy, in this paper, is defined as the agency and volition displayed by children during play. Autonomous play is free play initiated by a child without the intervention of others. Children's autonomy in play is defined as play that is independent of external control, in which they can concentrate, create, have a physically comfortable body language, express their ideas freely, and most importantly, enjoy themselves and disconnect from what is going on outside. Autonomy presents itself through behaviors that indicate an ease with which children express their ideas, their level of creative engagement, and their ability to independently concentrate on and sustain play. In this research, these indicators were planned in a structured observational framework that included a comparative scoring system to analyze changes in autonomy in different spatial conditions. The aim was to gain a deeper understanding of the nature of interaction between children, parents, and the space in which children play, and discuss how space can support the development of autonomy in children.

Given the interdisciplinary nature of the research topic, the paper draws on theories and research from developmental, educational, and environmental psychology, in addition to architecture. However, even though psychology literature suggests that characteristics of the physical environment affect children's behavior, including in play, only a small number of studies illustrate how (e.g., Abbas et al., 2012; Berg & Medrich, 1980; Woolley & Lowe, 2013). Some of these studies were conducted in artificial laboratory environments and focused on the effect of a small number of environmental stimuli (e.g., Pellegrini & Perlmutter, 1989). On the other hand, field research that documents the physical properties of space where children's play occurs naturally is limited, arguably due to a lack of access to techniques of surveying, mapping, or documenting the physical space. The present research can be seen as a product of collaboration between architecture and psychology to tackle the problem stated above. To demonstrate the way in which play spaces can foster autonomous behaviors in children, in other words, to assess autonomy and its spatiality, the author has conducted several workshops in which children's interactions with the spatial environment were observed systematically. In this research, both indoor and outdoor play activities were studied. Along with the use of geographical/architectural tools of mapping and drawing to document the features of play spaces precisely, psychology literature (e.g., Erikson, 1963; Fromberg & Ber-

gen, 2006; Smilansky, 1968) contributed to the planning of play activities and play settings, their documentation, data collection, and their interpretation.

2. Children, play, and autonomy

According to the literature on child development, the acquisition of autonomy is an important milestone. Erikson's (1963) theory of psychosocial development describes early childhood as marked by the "autonomy versus doubt and shame" conflict, in which autonomy is defined as learning to be independent (e.g., using a toilet by themselves, choosing their own clothes) and achieving a sense of self-efficacy as opposed to self-doubt. Only after mastering this rudimentary autonomy can the children move on to the subsequent preschool stage (3-6 years), where they learn to exercise initiative. At this stage, exploration and play are their important activities. Children of this age group display their newly acquired sense of agency in their play activities, through independent excursions and free play, without the control of parents. Their activities are supported by safe spaces and play environments that foster a sense of personal control (Côté-Lecaldare et al., 2016; Edwards, 2002; Erikson, 1963). Montessori (1964) emphasized the importance of autonomy in children, whose main area of expression is play. She recognized the connection between children's environment and the development of psychological autonomy. To advocate autonomy in children, the Montessori classroom environment typically offers choices to children (Lillard, 2005), thus encouraging them to make their own decisions and have control over the environment. According to this view, improvisational play settings allow children to display more autonomous behavior in comparison to structured settings. The spatial qualities of the play setting also contribute to the encouragement of such behavior. For instance, a study of inner-city children found that they engaged significantly more in creative and complex play in green outdoor spaces than they did in relatively barren spaces (Faber Taylor et al., 1998). Natural outdoor spaces offer more opportunities for unstructured and creative play. Play is important for supporting physical, emotional, and social development (Avcı Karaduman & Bozkurt, 2025).

Self-Determination Theory (Ryan & Deci, 2017) recognizes autonomy as one of the three basic psychological needs of humans, together with competence and relatedness. Kagitcibasi (2005) defines autonomy as a matter of agency and volition. An autonomous person can willingly initiate and direct their own actions without being controlled by external forces. Although the degree of autonomy is commonly measured on the dependent-independent dimension, autonomy does not necessarily mean separation from parents. Children can learn to be their own agents while at the same time maintaining close relationships with their parents (Kagitcibasi, 2005, 2017). The development of autonomy depends on the person's social environment. For instance, children's autonomy can be encouraged by parents and teachers who support independent decision-making and free exploration during play (Lapsley & Stey, 2010; Mani et al., 2012; Satani, 2021). Fromberg and Bergen (2006) point out changing trends in children's play, which is nowadays oriented towards digital and electronic play, organized sports and activities, creative and imaginative play, virtual and online play, and educational play, rather than traditional and outdoor play. One of the reasons for the changing trend is the increasing concerns about the safety and protective attitude of parents. Aman (2023) suggests that playground surfaces should be viewed not only as a safety requirement but also as an active design element. According to Hillman et al. (1990), the balance between the protective attitude of parents towards children and children's risk-taking is important for the acquisition of independent mobility. Permitting children to do some activities on their own and letting them take risks can also elevate their self-esteem (Hillman et al., 1990). Parental attitudes and behaviors—ranging from giving children complete freedom to restricting independent mobility out of safety concerns—inev-

itably affect children's behavior (Doucleff, 2021). For example, observation of Hart (1979) suggests that if adults let children play freely, they would use the entire space. Thus, the development of autonomy seems to be a product of the interaction and negotiation between the child and their parents. Therefore, when observing children's activities during play, parents should also be treated as participants.

3. Examining the gap: The dynamics of play, autonomy, and space

While existing research in architecture and related disciplines has examined the relationship between children and space, they do not address autonomy in children. Research in environmental psychology and related architectural studies has emphasized the importance of spatial issues by fostering thoughts on ecological approaches to visual perception (Heft, 1989), but architectural studies often focus more on broader child-environment interactions without explicitly framing autonomy as a central concept (Kyttä, 2004; Woolley, 2008). Some of the relevant literature has focused on participatory architecture, i.e., architecture in which children are involved in the design. While such studies (e.g., Arın Ensarioğlu & Özsoy, 2021; Ataol et al., 2020; Burke, 2005) tend to emphasize participatory approaches to understanding children's spatial experiences, they fail to systematically analyze how specific spatial conditions facilitate or inhibit autonomy. Given that autonomy is a fundamental component of children's activity, creativity, and socio-cognitive development (Deci & Ryan, 2000), more architectural research is needed to examine how spatial configurations and environmental affordances constrain or enhance, or at least influence, autonomy in play. This study aims to bridge this gap by integrating architectural analysis with theories of autonomy through interdisciplinary approaches, thereby contributing to a more comprehensive understanding of how space shapes children's experiences of independent play through case-based research.

4. Observing children's play

4.1. Research design

The research was based on field observation of children's autonomous behaviors during play. The researcher observed naturally occurring play behaviors of children in workshop settings and analyzed their patterns. Naturalistic field observation, as opposed to laboratory-based observation, has been a preferred methodological choice in the study of child development (Bronfenbrenner, 1977). Naturalistic observational methods have been widely and successfully used in the studies of children (e.g., Tan, 2019), especially in research on play and spatial experiences (Clark, 2005). Since behaviors observed in a controlled laboratory setting may not reflect real child–environment relationships (Bronfenbrenner, 1977), the choice of field research was crucial for the present study. This method also allowed the researcher to directly observe the influence of various spatial conditions on children's behaviors. Children, especially under 8 years old, tend to express themselves nonverbally, typically through activities such as making a map or building a miniature world with natural materials, more than using words (Hart, 1997). Children's perception of the world develops through direct interactions with the physical as well as social environment (Mitchell, 1991). Children flip the power balance between themselves and the environment by expressing their agency in play though the creation of a world fully controlled by them, thus transforming themselves from the *powerless* to the *powerful* (Percy-Smith et al., 2023). As Lester and Russell (2008) point out, the observation and evaluation of the play–space relationship need to be conducted by taking into consideration the dynamics between the parents' control directions and the children's actual behavioral tendencies. The method of field observation was an appropriate choice for capturing naturally occurring play patterns of children under specific spatial conditions (e.g. distance from

parents) and their connection to the emergence of autonomous behavior. For the reasons listed above, field observation research was designed to explore the dynamic relationship between children's play, space, and autonomy.

The field observation of children's play was conducted in the context of play workshops described in detail below. The researcher (the first author) facilitated these workshops while at the same time doing the observation, thus making her a participant observer. The types of play children display in the spaces, as well as the spatial properties of different settings, were carefully documented and qualitatively analyzed by the researcher using both architectural and psychological tactics.

4.2. Play workshops

Data collection was planned for the period of two months. The researcher organized as many workshops as possible within this limited period to enable repeated and comparable observations of play behaviors across different spatial conditions and activity types. As a result, 17 workshops were completed. The advantages of conducting multiple workshops were being able to include locations with rich contextual diversity and potential for children to explore a variety of materials available there. Meanwhile, also existed are the challenges of studying the environment–behavior interactions with children in the field. As with all field studies, limited controllability of confounding variables added to the challenge. As Berk (2013) suggests, activities had to be organized according to the attention span of young children. So, the workshops typically lasted up to one hour considering the concentration capacity of children. As Table 1 shows, there were six types of workshops (T1-T6), whose detailed descriptions can be found in Table 2. The content of workshops varied in terms of their activity types (see Section 4.5). Each type of workshop was intentionally held in more than one location. The spatial characteristics of these locations were coded using six space-type categories (see Section 4.4). The combinations of different activities and locations allowed for variations in the workshops.

The researcher (the first author) was responsible for the entire planning and setup of the workshops, which were held through consecutive weekends over a period of two months. Figure 1 presents the snapshots of 17 workshops as a collage, labeled with the workshop number.

4.3. Participants

The participants were children aged between 3 and 6 and their accompanying parents. Although gender was not a criterion for participation, all accompanying parents in the study were mothers. Developmental stage theories (Erikson, 1963; Vygotsky, 1978) helped determine the target age group. Ages 3 to 6 belong to a sensitive period in which, even though many capacities of children are not fully consolidated in terms of autonomy, they can be developed in a balanced manner by social interaction and guidance (Vygotsky, 1978). Children of this age group were expected to best display autonomy development during play, since they had already acquired basic physical autonomy (e.g., independent mobility) and were in the stage of learning to exercise initiative (Erikson, 1963).

The child–parent pairs were recruited through the researcher's social networks and connections using a purposive sampling strategy. Parents of 3 to 6-year-old children were targeted and invited to play workshops. Invitations were also shared via social media. Before the workshops, voluntary participants were presented with an informed consent form explaining the purpose of the research, the workshop procedure, the privacy protection of children, the confidentiality of the information gathered, and the use of the data for scientific research only. Those who agreed to let their child participate signed the consent form. Even though parents did not have a participatory role in the workshops, they brought their children and waited for them. Their presence was a crucial part of the study.

Table 1. *Summary of workshops.*

Workshops				Participants		Observed Play Criteria & Scores (1-7)						
No.	Type-Title	Space Type *1	Activity Type *2	Number of Children	Age Range	Parental distance	Concentration	Creativity	Independent Decision	Voicing	Joy	Free movement
1	T1. Design your own garden	S1	A3+A4	10	3-6	1	3	3	2	2	3	1
2	T1. Design your own garden	S3	A3+A4	3	4-6	5	5	5	6	6	5	5
3	T2. Dinosaur garden	S2	A3+A4	4	4-6	2	4	3	3	3	4	2
4	T2. Dinosaur garden	S3	A3+A4	4	3-5	5	7	7	6	6	7	5
5	T3. The Stone Age	S3	A3+A4	2	4-5	5	6	7	5	5	6	5
6	T2. Dinosaur garden	S2	A3+A4	4	4-5	2	3	3	3	3	3	2
7	T4. Toys from recycled materials	S3	A3+A4	20	3-6	5	6	6	7	7	6	5
		S4	A3+A4			7	7	7	7	7	7	7
		S5	A3+A4			5	6	6	7	7	6	6
		S6	A3+A4			5	6	6	7	7	6	6
8	T3. The Stone Age	S3	A3+A4	3	4-5	5	6	7	7	7	6	5
9	T5. Nature explorers	S4	A3+A4	4	3-5	7	7	7	7	7	7	7
		S5	A3+A4			5	5	6	7	7	5	6
		S6	A3+A4			5	6	6	6	7	5	6
10	T5. Nature explorers	S4	A3+A4	3	4-5	7	7	7	7	7	7	7
		S5	A3+A4			5	6	6	7	7	5	6
		S6	A3+A4			5	6	6	7	7	6	6
11	T6. Little architects	S2	A1+A2+A4	2	4-5	2	4	4	2	2	3	2
12	T6. Little architects	S2	A1+A2+A4	2	4-5	2	3	3	2	1	3	2
13	T6. Little architects	S2	A1+A2+A4	2	4-5	2	3	3	2	2	3	2
14	T6. Little architects	S2	A1+A2+A4	2	4-5	2	4	4	4	5	5	2
15	T6. Little architects	S6	A1+A4	3	4-5	5	6	6	7	7	5	6
16	T1. Design your own garden	S3	A3+A4	6	4-6	5	6	7	7	7	6	5
17	T1. Design your own garden	S3	A3+A4	5	4-6	5	6	6	6	6	6	5

*1 Space Type: S1. Indoor, Café; S2. Indoor, House; S3. Outdoor, Linear seating; S4. Outdoor, Cluster seating; S5. Outdoor, Group seating; S6. Outdoor, Random seating

*2 Activity Type: A1. Constructive ; A2.Play with Rules; A3. Physical; A4. Creative Play

The number of children who participated in each workshop varied (See Table 1). The same child could participate in more than one workshop. The total number of children who participated across the 17 workshops was 24 (13 males, 11 females). The mean age was 4.9 years. On average, the children participated in 3.3 workshops each. However, two children participated in all 17 workshops. All the mothers were university graduates, seven of whom had a master's degree. Although no direct effect of parental education levels on children's play could be measured at this stage, it is important to include this information as it may be necessary for future studies, especially when examining different cultural contexts or educational backgrounds of participants.

4.4. Spatial characteristics of the workshop sites

The workshop sites took place in the Kozyatağı district of Istanbul, in outdoor and indoor spaces such as Kozyatağı Garden (a private cafe with a garden) and a house. The workshop sessions alternated between indoor spaces and outdoor locations. These outdoor locations were chosen for security reasons. The workshops in the Kozyatağı Garden took place in an unstructured space of a large, enclosed private garden, protected from traffic by a fence but allowing children to move freely. Out of 17 workshops, 10 were held outdoors with various seating arrangements for different activities. The seating arrangements were observed to examine the children's autonomous behaviors and

Table 2. *Workshop types.*

Type	Title	Description
T1	Design your own garden	Children were given a container, soil, gravel, leaves, pine cones, and a few succulent plants, which are very easy to handle. Then, they designed their own little gardens as they wished. At the end of the workshop, they took their creations home and continued to water them once a week.
T2	Dinosaur garden	After learning fun facts about the dinosaur era, children hatched dinosaurs from egg-shaped ice using a small hammer or other methods. They then created miniature dinosaur habitats by planting plants in wooden containers while having a sensory experience with soil, water, and ice. They could also collect materials from nature whenever they wanted.
T3	The stone age	Children decorated balloons that serve as molds for cave structures. They covered them with craft paper and natural materials and then popped the balloons, leaving hardened cave structures. Placed in an earthenware container filled with sand and plants, these caves created personalized prehistoric environments. In doing so, they could express their creativity in any way they wanted with materials from nature. Children kept the caves they created.
T4	Toys from recycled materials	Children are encouraged to design their own toys using reused materials such as cardboard rolls and plastic bottles. They also collect natural elements to incorporate into their designs. By having hands-on interactions with recyclable and organic materials, they were encouraged to be creative and sustainable. With these materials, for example, they made tiny puppets to talk and interact with each other.
T5	Nature explorers	Children used magnifying glasses to explore nature while playing with recycled materials. They freely examined the nature of the moment. They also interacted with the natural environment by playing with water, soil, mud, branches, etc. Since this workshop took place in a large open wooded area surrounded by fences, it encouraged improvisational activities led by children's initiative.
T6	Little architects	Children explored historical architecture hands-on by recreating buildings from different eras, such as the houses of Çatalhöyük, Ancient Egypt, Rome, Greece, or the Middle Ages. First, they were introduced to these historical periods with a short, age-appropriate, simplified narrative. They then created their own tiny historical sites. Using a variety of materials. They gained insights into the architectural styles and construction techniques of these civilizations. At the end of the workshop, they kept their creations.

spatial interactions during play. Four different spatial configurations were experimented with: 1) Linear, in which wooden seating groups were arranged in straight alignment to encourage structured participation; 2) Group, in which seating groups were positioned in smaller clusters to facilitate face-to-face interaction and collaborative activities; 3) Clusters, in which seating areas were distributed around a central free natural space to encourage movement between spaces and various levels of participation; and 4) Random, in which benches were placed in an irregular arrangement to allow for spontaneous and flexible use of the space. These seating arrangements, differentiated according to the various workshops, were systematically documented and observed to understand how spatial organization affects children's autonomy, concentration, and self-expression during play. By deliberately creating variations of seating arrangements, other than macro scaled spatial differences, how those micro spatial configurations influenced children were also observed.

Spatial characteristics of the sites were documented using a coding system developed by the author, which combines several criteria, e.g., indoor-outdoor, familiar-unfamiliar, private-public, structured-unstructured, natural-artificial, as well as seating arrangements. The workshop sites were sorted into six space types: S1) Indoor-café (i.e., structured, unfamiliar, urban public), S2) Indoor-house (structured, familiar, private residential), S3) Outdoor-linear (i.e., natural, linear seating), S4) Outdoor-cluster (i.e., natural, clustered seating), S5) Outdoor-group (i.e., natural, group seating), and S6) Outdoor-random (i.e., natural, random seating).

Figure 1. *Photos of workshops.*

4.5. Types of workshop activities

The workshops included activities such as planting plants, sensory play with ice, working with recycled materials, and making simple architectural designs with children. The purpose was to emphasize creativity using natural or recycled materials and to

encourage children to make something with their own hands rather than solely being exposed to ready-made objects. For example, in the workshop titled "Design Your Own Garden," the children created their own gardens in tiny containers using natural materials such as soil, plants, stones, and pinecones. While the researcher generally chose to create content with natural materials, she was also involved in making other play materials, such as small model buildings for a workshop titled "Little Architects." The main selection criteria of the activities for workshops were to include both variety and comparability, allowing children to play across different settings in order to have subjective observation. The activities used in the workshop were categorized into four activity types with reference to the Parten-Smilansky Play Scale (Smilansky, 1968) and the play categories of Fromberg and Bergen (2006). The Parten-Smilansky Play Scale consists of social play (solitary, parallel, and interactive play) and cognitive play (functional, constructive, and dramatic play). Fromberg and Bergen, on the other hand, divide play into the following groups: functional play involving repetitive actions such as rolling a ball or stacking blocks; constructive play focusing on building and creating with materials such as blocks; dramatic play involving creative role-playing such as playing house or being a superhero; sociodramatic play involving group play with a story or theme; rule play involving structured play; physical play involving active physical actions; and imaginative play such as drawing, painting or music. The four activity types used to categorize the workshops were: A1) Constructive (e.g., building), A2) Play with rules (e.g., board games), A3) Physical (e.g., physically active), and A4) Creative play (e.g., imagination).

4.6. Observation procedure and the coding of observed behaviors

During the workshops, through various types of activities at different sites, children's autonomy-related behaviors were recorded with a pre-designed coding scheme to keep track of autonomy-expressive behaviors during play. In the content analysis of children's behaviors observed in each workshop, their patterns of behaviors were recognized and coded into tentative categories by the researchers. After completing all workshops and initial analyses, seven common categories were chosen and children's behaviors in each workshop were reevaluated based on these seven criteria: 1) the child-parent distance (e.g., how far away the child could comfortably stay from the parent), 2) the level of concentration (e.g., how often they would check whether the parent was there, how long they could concentrate without noticing anything), 3) creativity (e.g., how long they could create and express original and creative solutions), 4) Joy (e.g., how much time they could enjoy), 5) free movement (e.g. how easily they could move around freely), 6) independent decision (e.g., decision-making free from parental control), and 7) voicing (i.e., vocalizing and expressing of opinions). The researcher rated the children's play behaviors in each workshop according to the above seven criteria using a 7-point scale, ranging from 1 (Not at all) to 7 (Excessively), by examining her field notes, photos, and videos. Table 1 presents the resulting observed play scores for each workshop. The identified autonomy-expressive behaviors were compared across different "space categories" (S1-S6 as described in Section 4.4) and workshops.

4.7. Behavioral mapping procedure

The observations during the workshop and those made just after the workshop were handled differently in this research. Since free time following the end of the workshop was a very convenient time to record the children's free choices of space, this particular time was utilized to document the children's spontaneous play and the use of space. Typically, the researcher participated in the planned workshop activities together with the children for about 40 minutes. In the free time after the end of the designed activities, the observation of the children's activities

continued for another hour. The locations where the children spent a longer time were monitored in four separate 15-minute segments.

A mapping technique was used to record geographic information. Behavioral Mapping is a data collection technique used in the field of environmental psychology to record behaviors that occur in a specific setting to understand people-place interaction. It was originally developed by Ittelson et al. (1970). The reason for this strategy was to understand the pattern of the use of space and record the exact location the children preferred to use by their own initiative. Firstly, the site map was divided into 5 m x 5 m imaginary square grids by northings and eastings lines to indicate the size of the area in the mapping process. During each 15-minute recorded session, the points in the space where the children spent the most time were specifically identified and marked on the maps.

4.8. Research ethics

Ethical approval was obtained from the Yeditepe University Ethics Board of Social Sciences and Humanities, Meeting Decision No. 02/2025, dated 17.02.2025 (Item 3). Informed consent was obtained from all parents prior to the study.

5. Documenting the space of children's play

Figure 2 shows the spots where the children chose to spend time during the 15-minute observation sessions following the workshops. This mapping in Figure 2 emerged out of an overall analysis in which children's movements in these observation sessions across all the workshops were overlapped and superimposed. In the map, the points at which more time was spent were expressed graphically in larger circles.

The frequency of the children's choices of the same place, as well as how long they stayed at that same place, was particularly significant information. The observations revealed that the two kinds of data were correlated. Through the mapping, the children were found to stay in the places of their choice for longer periods compared to the ones they were asked to be in. This suggested that they were able to concentrate more on their activities in their chosen places.

Workshops No. 16 and No. 17 were taken as sample cases to illustrate mapping and spatial analyses here. Both workshops took place at a private garden located near a park, in a 25 m x 60 m green area in Istanbul, Kozyatağı. For mapping purposes, the garden

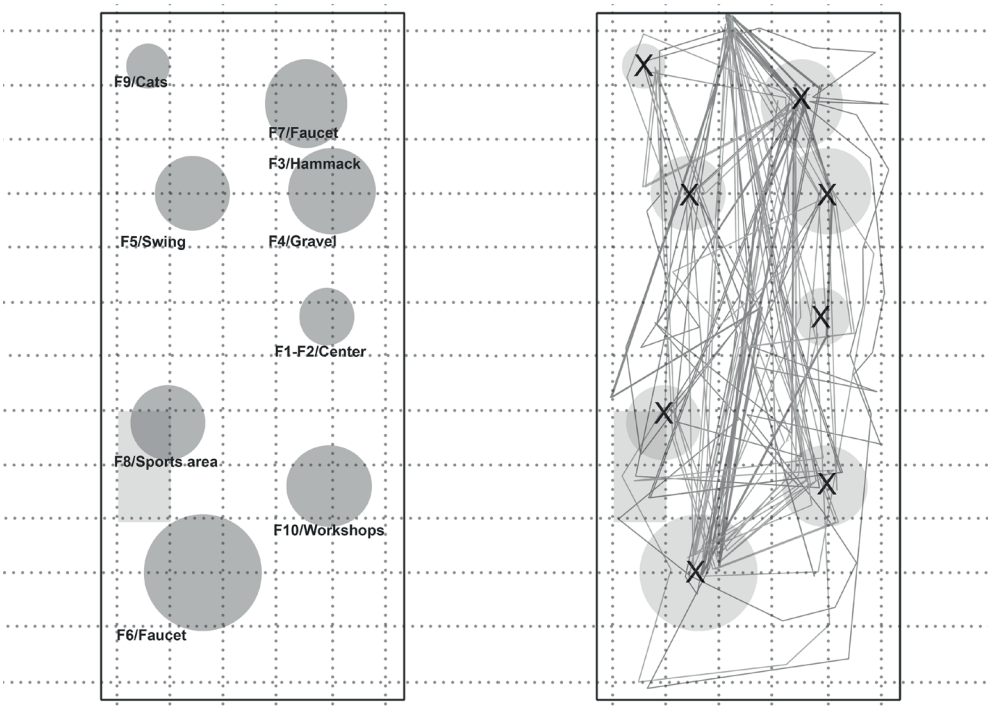

Figure 2. *Time sequence mappings.*

was divided into grid lines of five meter intervals. There were pine trees in all the intersections of grids, as shown in the sketch illustration in Figure 3. Variations in seating arrangements, structure, and natural elements were observed in this garden. Figure 3 illustrates the area where Workshops No.

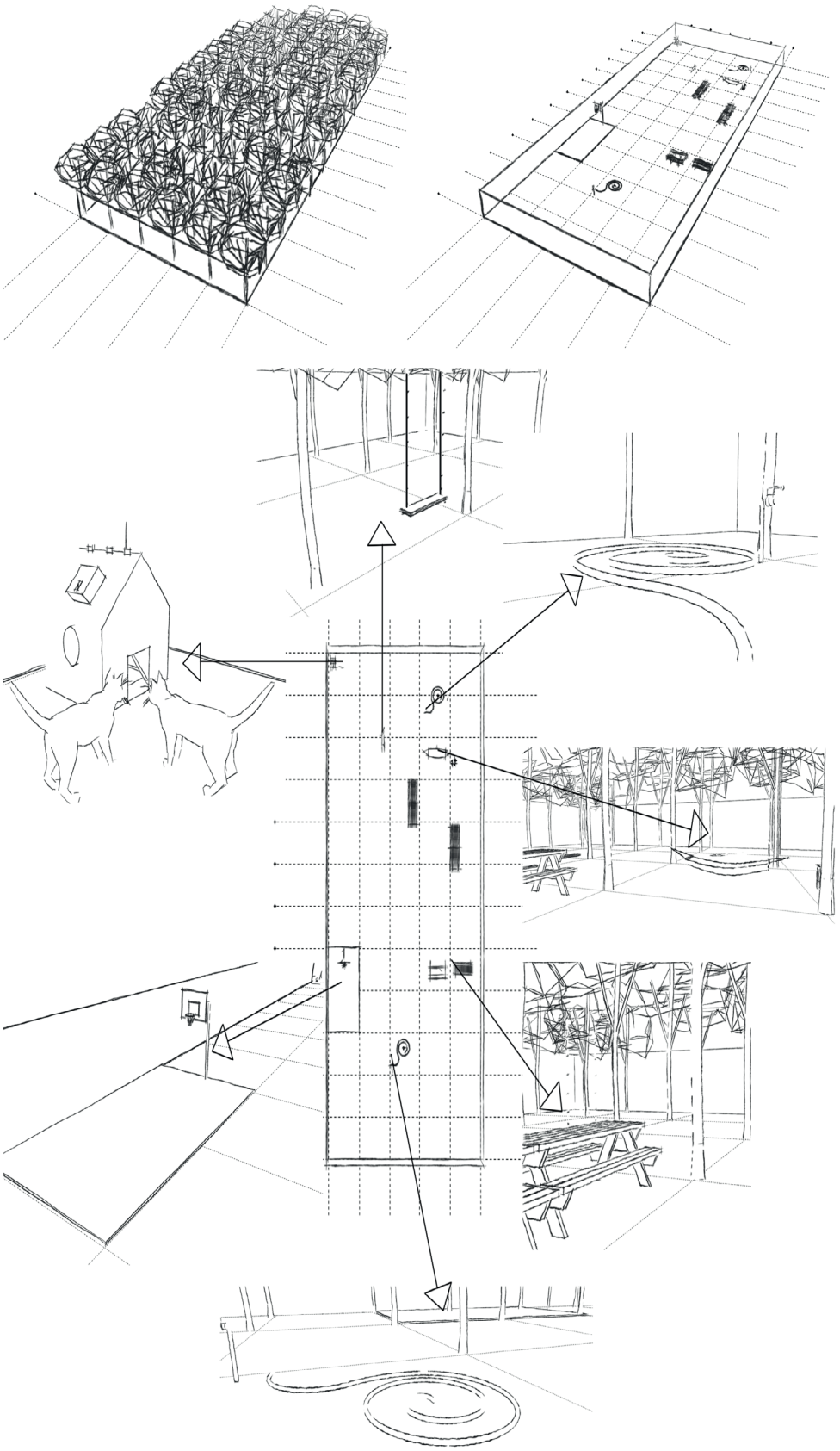

Figure 3. *Sketches of outdoor workshop areas.*

16 and No. 17 were held, depicting the spots in which children were particularly interested. While each workshop had a unique impact on the study, the workshops 16 and 17 were deliberately conducted at the same space to capture the repeating pattern to check the consistency of the observations.

The spots marked as F1 and F2 in Figure 3 were in the central area of the Kozyatağı garden with a long line of joined tables, where children's movements tended to be at ease, especially for the workshops with many children. Spots F3 and F4 were where the hammock was found and became a natural entertainment point where children could concentrate and willingly spend at least half an hour before or after the workshops. A simple wooden swing (F5), a faucet that did not usually run (F6), and a hose that usually had no water (F7) are also marked on the map. Of these, F5, where a simple swing tied to a pine tree with a long rope was found, was a natural spot where children could easily spend 15 uninterrupted minutes before or after the workshop to concentrate and have fun. They could spend time here without realizing how far away they were from their parents or what they were doing. This spot, which allows a lot of free movement, was highly preferred by the children.

Since the valve of the tap marked F6 was usually closed, there was very little residual water coming from it, and within the entire garden, this was the point where children chose to spend their time the most, and where they played with one another. Similarly, the hose with the valve marked F7, which was also usually closed with very little water left, was something with which children could play for a very long period, up to one or two hours. Sometimes, when the valve was open, children concentrated so much that they were not aware of any other stimuli. They would take the initiative and play with water in a state of ecstasy all day long, rarely checking with their parents. The concrete area marked as F8 had a simple basketball hoop. Children mostly used this spot as a giant drawing area where they could scribble with chalk and draw on the ground. The fact that it was a very large drawing area with no defined boundaries allowed them to express themselves as they wished. F9 was a cat care area where kittens are kept together, enclosed by a light wire cage. This area was of great interest to children before and after the workshop. The spot marked with F10 was the shadowy area where workshops were held with smaller or average numbers of children. Meanwhile, the parents were stationed closer to the children due to the spatial features. They inevitably interfered with the workshop activities and the children due to their proximity, thus negatively affecting the concentration of the children. The variations in parents' seating arrangements were linear, group, clustered, and randomized. Figure 4 presents the photographs of marked areas on the map and the seating arrangement found in each area. When the seating patterns were analyzed one by one, it was discovered that in the linear seating arrangement in the center, where only the children could sit for the workshop and the parents had to clear away, children would behave differently as they could make mistakes more easily and therefore engage with their own activities better.

As described above, a number of spots were found to invoke children's curiosity, encourage engagement, and help the children to focus on their activities for longer periods of time. These spots tended to be rich in natural materials and textures, unstructured, imperfect, but persistent. They are the kind of places that offer children a plenty of surprises and open-ended possibilities, thus encouraging their exploratory and spontaneous actions. In such environments, children are more likely to take initiative and navigate their environment with minimal external guidance. Thus, the mapping and its spatial analysis suggest that certain physical environments can play an important role in enhancing both concentration and autonomy in children, and that the development of concentration and autonomy takes place in parallel through space.

6. Findings

This study specifically examined how spatial dynamics supported autonomy in the context of play. The results

suggest that specific spatial features, both intended and unintended, play an important role in promoting autonomy, not just the general distinction between indoor and outdoor spaces. The study demonstrated how parents' location relative to the children's, as well as the emergence of unexpected play spaces, could significantly influence children's engagement. These findings suggest that it is not only the design or planned function of elements such as fountains, hammocks, swings, or their placement in the environment that shapes play experiences; rather, play itself actively transforms space, demonstrating that autonomy not only responds to the physical environment but also contributes to the spatialization of play. Figure 5 shows the differences in observed behavioral outcomes (mean scores across different workshops) by five space types (S1. Indoor café; S2. Indoor house; S3. Outdoor-linear; S4.

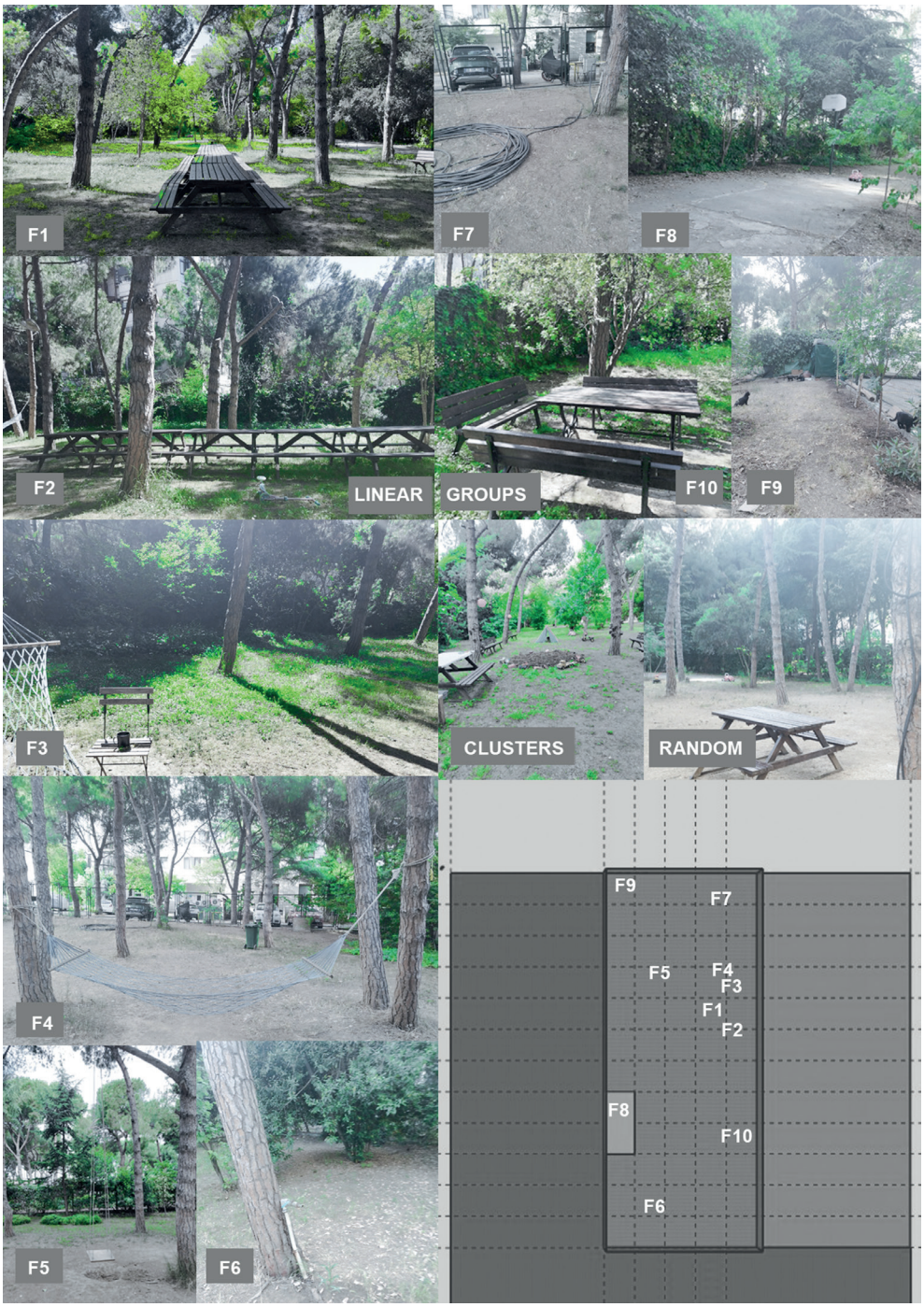

Figure 4. *Photos of marked areas in outdoor workshops.*

Outdoor-cluster; S5. Outdoor-group; S6. Outdoor-random). The contrast between the indoor spaces and the outdoor spaces is striking in Figure 5, suggesting that children's behavior adapts markedly in response to changes in the spatial environment.

Furthermore, observations of the same behavioral patterns across different types of workshops held in the same type of environment suggested that spatial factors, rather than workshop content, considerably influenced the children's creativity and autonomy-expressive behaviors. The qualitative, structural analysis of play environments highlighted core patterns in how different environmental elements framed children's participation and behavior.

6.1. The role of parental proximity in autonomy

The parents' positioning strongly determined how the children's behaviour displays autonomy. In enclosed indoor spaces such as the one used in Workshop No. 1, children's autonomy was constrained as they often sought approval from nearby parents. Limited space and parental proximity restricted their independent exploration. In contrast, outdoor workshops such as No. 2 and No. 4 allowed children to move away from parental supervision, encouraging increased autonomy and self-directed play. In addition, the highest levels of joy, concentration, and autonomy were recorded at locations further away from parents, highlighting the positive impact of distance on children's autonomy. Defined environments, such as fenced areas, supported autonomous behaviors by contributing to children's sense of safety.

6.2. The impact of indoor and outdoor spaces on autonomy and creativity

Workshops held in open spaces consistently resulted in higher levels of autonomy, self-expression, and creativity. For example, Workshop No. 7, held in a large open space, recorded the highest levels of independent play and creative expression. Similarly, Workshops No. 9 and No. 10, which involved free play in a fenced outdoor area, showed that semi-enclosed spaces could also encourage autonomy by allowing freedom of movement while maintaining structure. A positive association was observed between the characteristics of the space and the children's concentration, which in turn enhanced creativity. Children who were immersed in play without feeling observed exhibited more confident and autonomous behavior. This was particularly evident in natural settings where children felt less closely followed.

6.3. The impact of familiarity on comfort and autonomy

Familiarity with a space, as seen in Workshop No. 3, enhanced comfort, but did not significantly increase autonomy due to spatial constraints

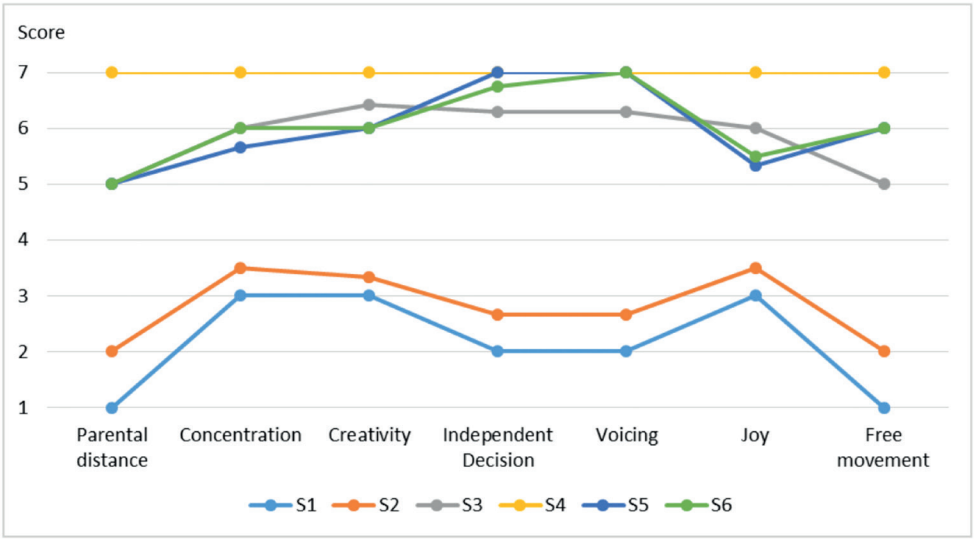

Figure 5. *Observed autonomous behaviors by space type.*

similar to those in Workshop No. 1. While familiar spaces can increase comfort, they do not necessarily promote independence if physical limitations persist.

6.4. Unstructured natural environments and open spatial configurations

Workshops with more unstructured natural environments, such as No. 7 and No. 9, encouraged spontaneous creativity and autonomy. Flexible seating arrangements, such as those found in Workshop No. 15, also encouraged more movement, self-expression, and creative engagement. Open outdoor spaces without such rigid boundaries as ceilings provided sensory stimuli that enriched play and supported creativity.

6.5. Spatial variables related to autonomy

The main spatial variables positively associated with autonomy were the following:

- 1. Spatial distance between parent and child: Increased distances were associated with higher autonomy, as shown in the spatial mapping of joy and concentration.
- 2. Spatial openness of the environment: Open spaces consistently facilitated autonomy compared to closed indoor spaces.

These relationships were clear in time sequence mapping, where autonomy was highest at spatial points far from parents.

7. Discussion

Childhood is a precious and irreversible time. Children's increasing mastery of autonomy is essential to their development, and in this process, it is crucial to provide them with a supportive environment, physically as well as socially. As play activities allow children to express themselves easily and let them be who they want to be, the provision of autonomy-supportive play space is of particular importance. Therefore, the main goal of this study was to understand the relationship between space and autonomous play. For this purpose, both theoretical inquiry and observational research were conducted. The findings supported the idea that children's interaction with space during play contributes to their autonomy. Autonomy in children was found to vary depending on the space, and the setting that encouraged autonomy was the one where children could play outdoors, but safely. There also seems to be a positive connection between children's concentration, autonomy, and creativity. The structured play space, in which children were watched and often corrected by parents, decreased autonomy.

It appears that settings with natural elements not only promote children's creativity and autonomy but also create a safe environment with soft ground such as mud, soil, sand, and other soft elements such as leaves and gravel. The safety of the environment also seems to relax the parents, enabling them to stay away and intervene less. These natural elements also tend to present unexpected moments, such as the sudden fall of leaves or insects passing, which in turn bring out children's instinctive spontaneity in play, with the contribution of the lack of spatial limitations like ceilings or walls. Both the two-dimensional and three-dimensional constraints in indoor spaces, i.e., relatively small spaces, were found to produce much more negative results for children in terms of autonomy, compared to outdoor spaces without such constraints.

Research had previously shown that nature could improve people's ability to pay attention and concentrate (Faber Taylor et al., 2001; Ohly et al., 2016; Wells, 2000). This study on the observation of children's play in the workshops has verified the improvement of concentration, which is one of the important indicators of their autonomous play. Regarding the distance between the parent and the child, the findings suggest that a certain seating arrangement where parents can be stationed at a distance or without a direct view of their children can facilitate children's autonomous activities. It may also be important to provide an environment that takes parents' attention away from their children. In this respect, the outdoor environment with its natural elements may be ideal for parents as well

due to its restorative and involuntary attention-catching effects (R. Kaplan & Kaplan, 1989; S. Kaplan & Talbot, 1983). The present study shows that open, natural environments support children's independent and creative play.

This observational research was conducted in Kozyatağı, Istanbul, mainly with children from middle-class families. Moreover, mothers of the children who participated in the workshops were highly educated. The authors are aware of the need to take cultural background into account in the definition of autonomy, as Kagitcibasi (2005) emphasizes. Future research can focus on children from different socio-cultural backgrounds to see the influence of demographics on parental attitudes and children's behavior related to autonomy.

The significance of the present research lies in the documentation of children's behavior in naturally occurring play settings. This field research documented the interaction between different children, different physical settings, and different play activities. Across the different combinations of these variables, common patterns emerged; children's creativity and autonomy-related behaviors showed a pattern of increase in outdoor space. Thus, the findings from the observations and environmental analysis reinforced the idea that physical environments can influence children's autonomy and creativity. However, the present research is qualitative in nature. So, the conclusion drawn is tentative. To prove the causal effect of the physical environment on children's autonomy and exclude the effect of play activity, the use of a stricter experimental design and inferential statistics is required in future research. Nevertheless, the architect-psychologist collaboration in the present study and the resulting use of behavioral research with architectural visual documentation of space should serve as a contribution in both fields. Further collaborations are encouraged for architectural and environmental psychological research.

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