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Evaluating Urban Image from Children's Perspective: The Case of Trabzon Ortahisar

Kent İmgesinin Çocukların Perspektifinden Değerlendirilmesi: Trabzon Ortahisar Örneği

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ABSTRACT

Cities, which are significant spaces for the physical and mental development of children, are typically defined by paths, edges, nodes, districts and landmarks. The aim of this study is to identify the perceptual approaches of children, whose interactions with their surroundings are currently limited, towards the city, and to measure their interactions with social, natural, and historical environments. The research area encompasses the Ortahisar district of Trabzon province. The methodology of the study includes verbal surveys and mental maps. Six middle schools were randomly selected from different socio-economic regions to provide representation from various parts of the district. Data obtained from 256 surveys and 192 mental maps were analyzed using MAXQDA 2020 Analytics Pro. The Jaccard similarity index validated data reliability, showing an average similarity of 91.23% for surveys and 54.80% for mental maps. According to the findings, while nodes were predominant in verbal data, landmarks were more prominent in visual data. Moreover, a significant relationship was found between landmarks and historical sites (Spearman correlation = 0.744, N=256). Consequently, it was revealed that the northern part of the city is more comprehensible in the minds of children.

Keywords: Child; image of city; mental map; space perception.

ÖZ

Çocukların fiziksel ve zihinsel gelişimi açısından önemli mekânlar olan şehirler genellikle yollar, kenarlar, düğüm noktaları, bölgeler ve işaret öğeleri ile tanımlanır. Bu çalışmanın amacı, günümüzde mekânla etkileşimleri sınırlı olan çocukların kente yönelik algısal yaklaşımlarını belirlemek, sosyal, doğal ve tarihi çevrelerle etkileşimlerini ölçmektir. Araştırma alanı Trabzon ili Ortahisar ilçesini kapsamaktadır. Çalışmanın metodoloji kısmı sözlü anketler ve zihinsel haritaları içermektedir. Altı ortaokul, farklı sosyoekonomik bölgelerden rastgele seçilmiş ve ilçenin çeşitli yerlerinden temsil sağlanmıştır. 256 anketten ve 192 zihinsel haritadan elde edilen veriler MAXQDA 2020 Analytics Pro kullanılarak analiz edilmiştir. Jaccard benzerlik endeksi, anketler için ortalama %91,23 ve zihinsel haritalar için %54,80 ortalama benzerlik göstererek veri güvenilirliğini doğrulamıştır. Bulgulara göre; sözel verilerde düğümlerin sıklığı baskınken, görsel verilerde işaret öğelerinin daha yoğun olduğu görülmüştür. Ayrıca işaret öğeleri ile tarihi yerler arasında anlamlı bir ilişki tespit edilmiştir (Spearman korelasyonu=0,744, N=256). Sonuç olarak şehrin kuzey kısmının çocukların zihninde daha anlaşılır olduğu ortaya çıkmıştır.

Anahtar sözcükler: Çocuk; kent İmgesi; zihinsel harita; mekan algısı.

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TMMOB Şehir Plancıları Odası

1. Introduction

In recent years, rapid urbanization, one of the most significant issues the world and in Turkey, has considerably impacted children, a substantial population group. Uncontrolled urban growth has led to a decrease in necessary spatial arrangements for children and restricted their movements in urban spaces.

Unplanned and irregularly developed urban spaces negatively affect children's behaviors, attitudes, and reactions (Al-Khalaileh, 2004).

The urban spaces where children are located are crucial for their physical, mental, and social development. It is essential for children to move freely in these spaces for their development. Numerous studies have shown that children's behaviors are determined more by the environments they are in than by their intelligence and personality traits (Tandoğan, 2014).

In recent years, various studies have been conducted in fields such as urban planning, architecture, and landscape architecture on children's perception and the relationship between environment and space. Children, different from adults in terms of mental, physical, and cognitive development, assign meanings to the spaces they live in, which affects their behavior and development. Therefore, the spaces children interact with during their development process are vital.

Many methods are known to understand children's views and expectations about the spaces they live in. Cognitive maps, surveys, interviews, and observations are some of the most well-known methods. Cognitive maps involve the mental structuring and interpretation of clusters of information, including memories and experiences, during the evaluation process of observed physical spaces (Golledge & Stimson, 1997). Drawing is not only a fun activity for children but also a way to express themselves sincerely. However, it is known that the use of this evaluation method as a systematic measure is still in development. Therefore, it is often used alongside surveys or observation methods to support findings.

According to Eraydın (2016), the environmental components of the city and the meanings assigned to these components are called the representative city image. One of the most well-known methods for reading a city through images is the cognitive mapping method used by Kevin Lynch in his 1960 study "Image of City." Lynch's (1960) study aimed to define how people understand and interpret their environments, conducted in the cities of Boston, Jersey City, and Los Angeles in the United States. According to Lynch (1960), the formation of these physical elements in the mind results from a two-way process between the observer and the existing environment. Lynch identified five basic urban elements in perceiving urban space: paths, edges, districts, nodes, and landmarks. These elements are used by people to perceive the city and create mental maps (Lynch, 1960). Many studies have followed Lynch's work in this area.

Drawing is one of the best ways for children to express themselves. According to Yavuzer (2019), a drawing is a child's language of thought, providing important information about their growth process. A child expresses the world they see through their perception via drawing. Freeman and Vass (2010) conducted a study with 163 children aged 9–11 in Dunedin, New Zealand, to understand children's relationships with the city and neighborhoods they live in. The study utilized both verbal interviews and cognitive maps. Findings revealed that children could reflect their views about their neighborhoods on cognitive maps, but this was not paralleled in verbal interviews. Therefore, it emphasized the importance of considering interviews while making inferences about children's lives based on cognitive maps (Freeman & Vass, 2010).

Çubukçu and Çevikayak's (2016) study titled "Comparison on Representation of Space Perception in Children" investigated how children perceive their living environments using the cognitive mapping method. The study conducted with children aged 5–14 included surveys along with cognitive maps. Findings showed that children aged 5–7 preferred drawing pictures, those aged 9 preferred pictorial maps, and those over 10 preferred drawing maps. Drawings of younger children included the house and its immediate surroundings, while older children's drawings added neighboring structures and landscape elements (Çubukçu & Çevikayak, 2016). In the study titled "An Application on Children and the Perception of Space", conducted by Canoğlu and Geçimli (2020) to make an evaluation of children's spatial and environmental awareness, a workshop was designed with children between the ages of 11–14. As a result of the activity consisting of two-dimensional drawings and writings, it was determined that children's spatial perceptions increased and they developed a critical perspective (Canoğlu & Geçimli, 2020).

Baksi (2018) conducted a study titled "Examining Children's Spatial Perception Through Living Environment," which examined how children perceive their living environment and the development of spatial perception through cognitive maps and surveys. The study with children aged 9–10 found that gender differences in children showed differences in spatial perception, elements that triggered feelings of belonging and satisfaction impacted spatial perception, the perception of children passing through topological and projective spatial stages paralleled their age, sociocultural and economic status affected children's spatial perception (Baksi, 2018).

Yılmaz (2005) conducted a study titled "Examining Environmental Perception Processes of Children Living in Tarlabaşı Through Cognitive Maps" with 47 students. The study's results, obtained through surveys and mental maps, showed

that children's drawings varied based on factors such as gender, birthplace, family socioeconomic status, comfort level, number of siblings, duration of residence in the neighborhood, and previous living places (Yılmaz, 2005).

Canoğlu and Geçimli (2020) conducted a study titled "An Application on Children's Spatial and Environmental Awareness" to evaluate children's spatial and environmental awareness. The study, conducted with children aged 11–14, included a workshop with two-dimensional drawings and writings. The results indicated that children's spatial perceptions increased, and they developed a critical perspective (Canoğlu & Geçimli, 2020).

Based on the reviewed research, this study aims to reveal the urban space perception of children regarding their living environment through urban images, focusing on natural, social, and historical environments. The age group selected for the study is children aged 10–12, classified by Piaget (1967) in the concrete operational stage. The reason for selecting children of this age group as a sample is that during this period, children's mental structures develop from childhood to logical thinking, spatial perception, and expression skills.

In this study, three main research questions derived from the literature were sought answers:

1. What is the relationship between the image elements (paths, edges, districts, nodes, and landmarks) obtained from the survey forms answered by the participants and the natural, social, and historical environment?
2. What is the relationship between the image elements (paths, edges, districts, nodes, and landmarks) obtained from the survey forms answered by the participants and the perception of safe and unsafe spaces?
3. What is the relationship between the image elements (paths, edges, districts, nodes, and landmarks) obtained from the mental maps drawn by the participants and the natural, social, and historical environment?

To understand the relationship between the image elements (paths, edges, districts, nodes, and landmarks) obtained from the survey forms answered by the participants and the mental maps drawn by the participants with the natural, social, and historical environment, ratio analysis, code relation map, and Spearman correlation analysis were used.

The originality of the study lies in its aim to fill a significant gap in the literature on children's urban space perception. The study provides new and valuable insights into how children's spatial perceptions can be more effectively considered in urban planning by examining in detail the relationship between urban images and natural, social, and historical environments. For example, Freeman and Vass's (2010) study emphasized the importance of using cognitive maps and interviews together, while this research focuses specifically on the spatial perceptions of children aged 10–12, examining the relationship between their mental mapping skills and survey results during the concrete operational stage. Unlike Çubukçu and Çevikayak's (2016) study, this research focuses on the role and importance of natural, social, and historical environment elements in children's spatial perception, thus providing new and valuable information on how children's perspectives can be more effectively considered in urban planning and design. In this context, the study makes significant contributions to the literature in the fields of urban planning and urban design towards creating child-friendly cities.

2. Research Area and Methods

2.1. Research Area

The study area encompasses the Ortahisar district of Trabzon province. Ortahisar, located in the Eastern Black Sea region of the Black Sea Region, is the central district of the province bordering the Black Sea (Fig. 1).

Ortahisar is geographically located at 40°57'22.30" North latitude and 39°44'6.14" East longitude. The district covers an area of approximately 189 km² and has an elevation ranging from 0 to 700 meters (Trabzon Valiliği, 2021).

Ortahisar, chosen as the study area, is the most populous district of Trabzon. It is bordered by Akçaabat to the west, Yomra to the east, the Black Sea to the north, and Maçka and Düzköy to the south. Since its establishment, the district has been the oldest settlement in the city and hosts numerous historical and cultural values.

Throughout history, the city of Trabzon has been home to many civilizations. Consequently, it is one of the settlements where the physical changes between civilizations can be observed in depth (Demirkaya & Tuluk, 2018).

Although there is no precise information regarding the establishment date of Trabzon, it is known to date back to the 2000s BC. Many sources generally accept the establishment date as 756 BC. The city, existing since ancient times, has hosted a wide cultural perspective, including civilizations such as the Milesians, Persians, Romans, Byzantines, Comneni, Genoese, Ottomans, Russians, and Turks (Aksoy, 2009).

Due to this rich historical background, many historical values have survived to the present day. The city's history includes walls dating back to the 13th and 14th centuries and numerous churches. Among the most important churches is the Hagia Sophia, rebuilt at the beginning of the 15th century and converted into a mosque in 1572. Today, it is both a museum and a mosque. Similarly, the Fatih Mosque, formerly used as a monastery, is currently used as a mosque. The Gülbahar Hatun Mosque, built in memory of the mother of Yavuz Sultan Selim, the Kanuni House, a historical Turkish house in

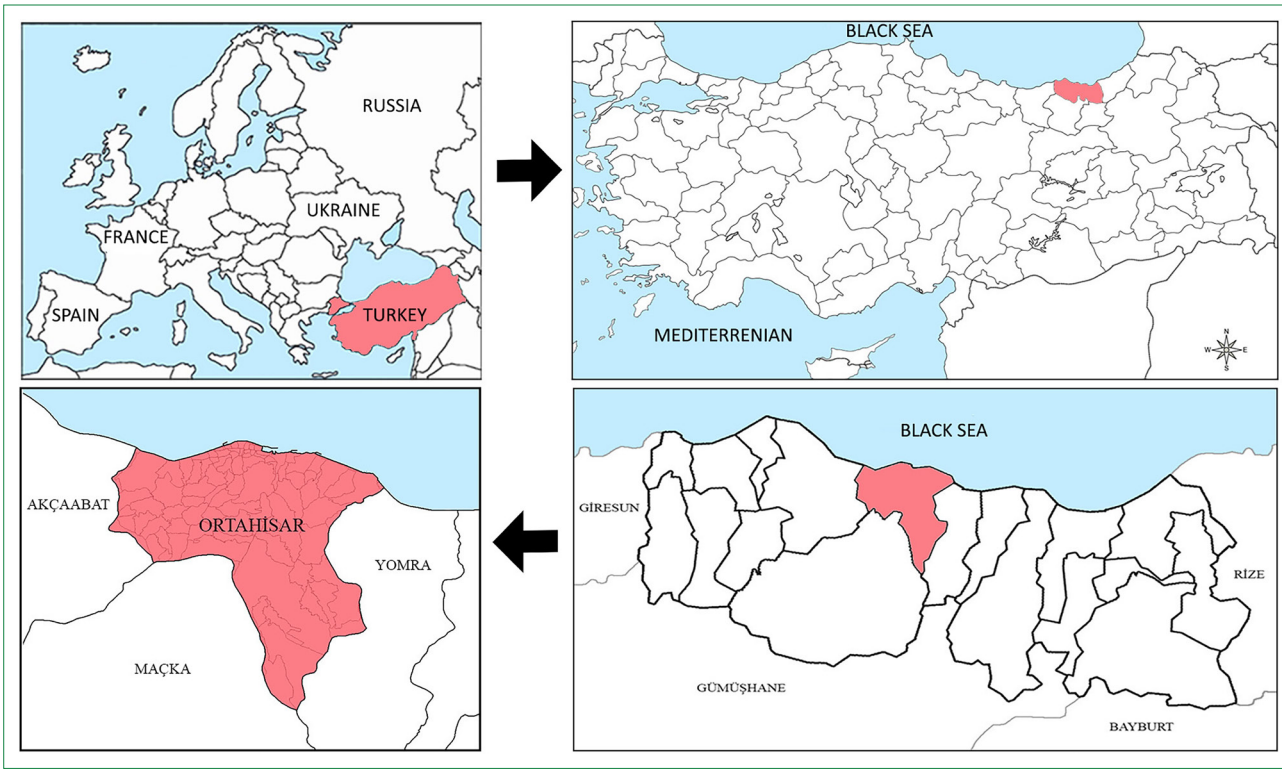

Figure 1. Location of the study area.

Ortahisar, and the Atatürk Pavilion, a summer house built by Konstantin Kabayanidis and used by Mustafa Kemal Atatürk during his visits to Trabzon, now serving as a museum, are a few examples of the historical buildings in Ortahisar.

The study was conducted in six middle schools located in Ortahisar, which is rich in historical values and serves as the central district of the city: Bedri Rahmi Eyüboğlu Middle School, Kanuni Middle School, Pelitli 75. Yıl Cumhuriyet Middle School, Karlık Middle School, Çağlayan Merkez Şehit Gürcan Bayrak Middle School and Bulak Middle School.

2.2. Features of Participants

Children in the concrete operational stage (ages 7–12) participated in the study. Children in the selected age group are aware of being members of society and reflect this in their drawings. Compared to their earlier years, children in this stage draw more detailed lines and adopt a realistic approach. They begin to learn concepts such as logical thinking, numbers, time, space, size, volume, and distance, acquiring the ability to classify and group these concepts (Yavuzer, 2019). Therefore, children aged 10, 11, and 12, who fall within the concrete operational stage (ages 7–12), were chosen as the sample group. Additionally, the study utilized data obtained from the drawings made by children using the mental mapping method. The literature indicates that children aged 7–12 start to portray reality in their drawings (Pinciotti & Weinstein, 1988).

2.3. Data Collection and Processing

The methodological scheme of the study consists of four main steps:

- Obtaining secondary data through literature review and identifying existing urban elements,
- Collecting primary data through a survey form that includes frequently used questions in studies along with the conceptual framework derived from the literature,
- Determining the schools where the survey will be conducted and selecting the sample size,
- Analyzing and evaluating the data.

The theoretical framework of the study was established by examining studies and methods from the literature review. Secondary data were obtained by defining the study area in terms of urban elements. Based on the obtained data, a survey form consisting of verbal and visual images sections related to the research topic and area was created. The verbal images section comprises 20 multiple-choice and open-ended questions, including general sociodemographic information. The visual images section, the drawing section, consists of a blank A4 sheet. For the selection of schools where the study would be conducted, the locations of middle schools in Ortahisar district were identified, and the district was divided into six

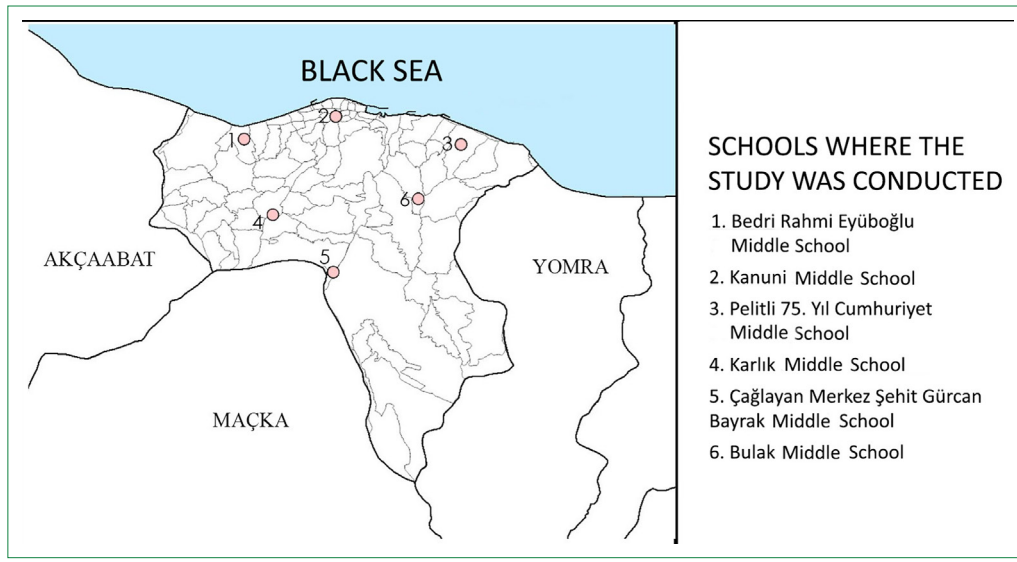

Figure 2. Location of the schools where the study was conducted.

equal parts. To ensure a socioeconomically diverse sample, six schools were randomly selected from these parts (Fig. 2).

A total of 256 children from Bedri Rahmi Eyüboğlu Middle School, Kanuni Middle School, Pelitli 75. Yıl Cumhuriyet Middle School, Karlık Middle School, Çağlayan Merkez Şehit Gürcan Bayrak Middle School and Bulak Middle School participated in the study. However, since the study was based on voluntary participation, only 192 out of the 256 children who participated in the verbal section also participated in the visual section activity (Table 1).

The fieldwork for the study was conducted in April 2021. Due to the restrictions brought about by the pandemic conditions resulting from the Covid-19 outbreak that affected the world in 2019 (partial lockdown), the study was conducted online in all schools except Karlık Middle School. Consequently, the verbal section of the study was conducted online with 216 participants and face-to-face with 40 participants, while the visual section was conducted online with 152 participants and face-to-face with 40 participants.

The online activities, which lasted for approximately 10 days, were completed by participating in appropriate classes through Zoom 2020, an application that enables multi-person video chatting. The survey questions, which included multiple-choice and open-ended categories, were organized through Google Forms and sent to the children. The activities were completed during a 30-minute class period in which the survey was conducted. The children interacted with each other and continued the work while chatting. After completing the survey questions, they moved on to the visual section, which involved drawing a mental map. The face-to-face work at Karlık Middle School was conducted within one day, taking necessary precautions in compliance with pandemic conditions.

After completing the survey in the verbal section, the children were given an A4 paper and asked, "Can you draw a map of Trabzon's Ortahisar district as accurately as you can remember using freehand techniques?" Prior to the study, information about the edges of the Ortahisar district was provided, and any unclear points during the study were clarified. The activity was completed within a 30-minute class period.

Table 1. Schools where the study was çonduçted and the number of students partiçipating in the study

Schools where the study was conducted	Number of students working with
Bedri Rahmi Eyüboğlu Middle School	60
Kanuni Middle School	18
Pelitli 75. Yıl Cumhuriyet Middle School	76
Karlık Middle School	40
Çağlayan Merkez Sehit Gürcan Bayrak Middle School	28
Bulak Middle School	34
Total	256

2.4. Data Analysis

The MAXQDA 2020 program was used for data analysis. Initially, the surveys completed by the participants and the drawn mental maps were processed into the program to prepare data sets. The program's coding system was utilized to analyze the prepared data sets. Eleven separate code groups were identified in the coding system: Paths, Edges, Districts, Nodes, Landmarks, General Descriptions, Historical Environment, Social Environment, Natural Environment, Perception of Safe Spaces, and Perception of Unsafe Spaces. These code groups facilitate the analysis of the study's verbal and visual section outputs.

To determine whether the data obtained from this study reached a saturation level, a Jaccard similarity analysis was conducted. The Jaccard similarity index is a measure used to define the similarity or diversity between documents (Hamers et al., 1989). This measurement, used in sequential access, allows us to access documents from the most relevant to the least relevant based on similarity coefficients (Oğuz, 2020). Baltacı (2018) stated that a sample size of approximately 30 participants is sufficient for a data source in qualitative research (Baltacı, 2018). In addition to this information, a saturation analysis was conducted, concluding that a sample size of 256 is sufficient for the study. According to the results obtained from the verbal section, the similarity ratio was found to be 91.23%. In the visual section, the similarity ratio was determined to be 54.80%. These ratios indicate that the study's data have reached a saturation level.

Subsequently, ratio analysis was performed separately on the open-ended questions and hand-drawn maps to identify the city's image elements based on the data obtained from the verbal and visual sections. Ratio analysis involves determining the occurrence rate of image elements within all surveys within specified ranges (Öğçe & Demir, 2020). Values were identified for weak, normal, and strong images. The formulas are as follows:

Maximum Percentage-5% / Specified Range=Fixed Value (A)

Weak Imagination: 5%+A=B (Initial Threshold Value: 10%-%B)

Normal Imagination: B+A=C (Second Threshold: %B-%C)

Strong Imagination: %C value and above.

To make the evaluation more understandable, the values obtained from the surveys and mental maps were transformed into symbolic maps using Adobe Photoshop CS6. In the created maps, five different symbols were used, with variations in opacity or shading to indicate their dominance levels (Fig. 3).

Additionally, to understand the dominance levels of the image elements used in the verbal and visual sections, frequency analysis was used, and Spearman's Correlation Analysis was

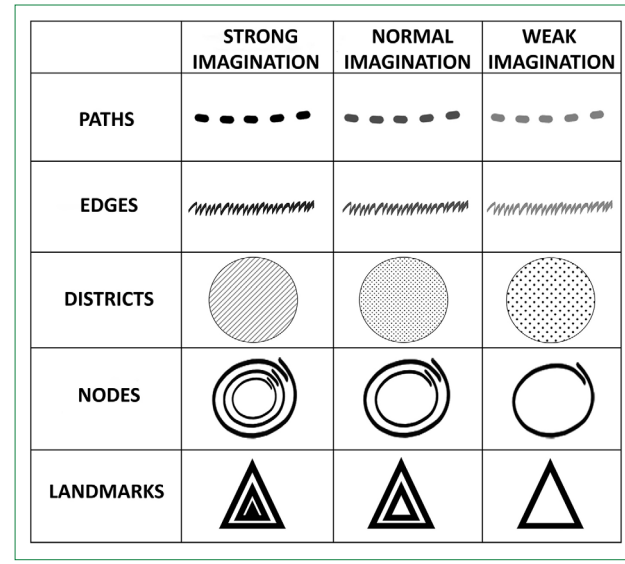

Figure 3. Image map representations.

employed to determine the relationship between variables. Spearman's Correlation Analysis is used when there is no quantitative and normal distribution between the variables being studied. The correlation coefficient (r) ranges from -1 to +1 and is interpreted as follows:

- < 0.16 very weak relationship
- Weak level of relationship between 0.16–0.29
- Low level of correlation between 0.30–0.49
- Moderate relationship between 0.50–0.69
- Strong (high) relationship between 0.70–0.89
- If 0.90–1.00, there is a very strong (very high) relationship.

Finally, a code map was created to evaluate the relationship between the identified codes.

3. Results and Discussion

According to the results obtained from coding the verbal section data, children mostly responded to survey questions using the imagistic element as their focal point. The most important three imagistic elements retained verbally regarding the city were Meydan (District) with a frequency of 323, Uzun Street (Path) with a frequency of 213, and Atatürk Mansion (Landmark) with a frequency of 208. The least retained imagistic element in their minds was Uzungöl (District) with a frequency of 15. The most frequently used imagistic elements in participants' survey responses are symbolically presented in Figure 4 based on their rates of imagery.

The data distribution point identified has been based on the reference of the ratio analysis formula to obtain more distinct data with a distribution point of 5% and above. Through the ratio analysis, imagery levels have been classified into three intervals: weak, normal, and strong imagery (Table 2):

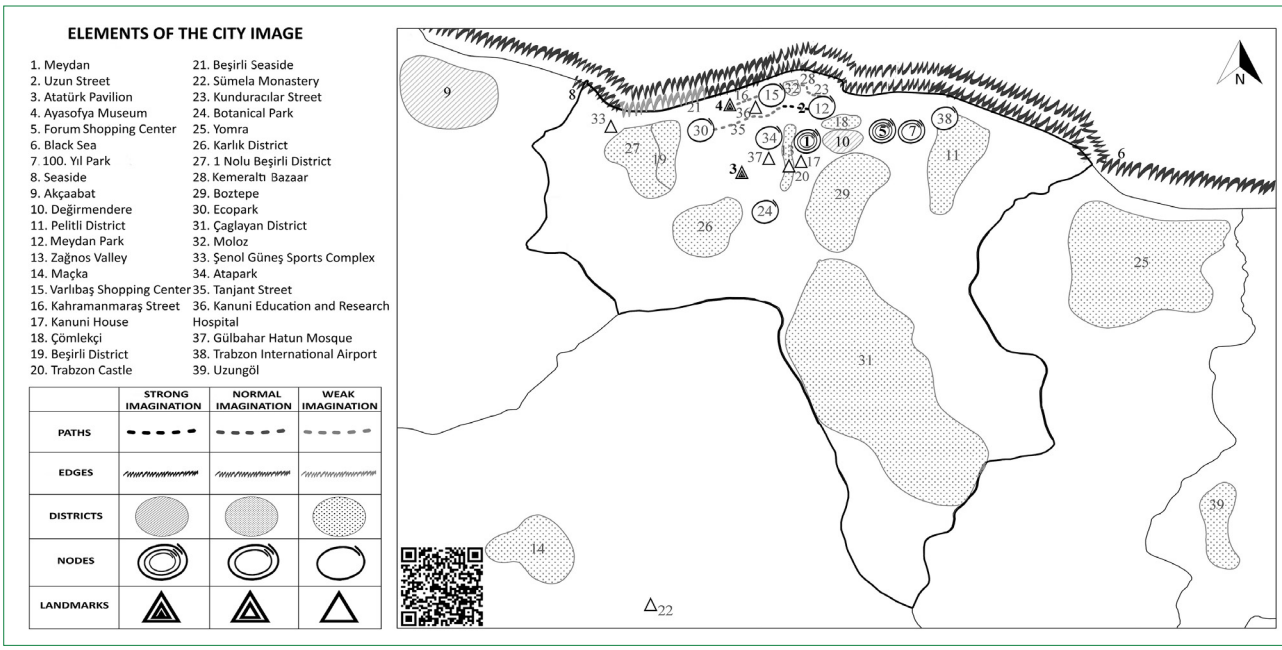

Figure 4. Verbal imagery map.

Flat Rate: 76.65−5=71.65/3=23.883

Weak Imagination: 5+23,883=28,883 (range 5% and 28,883%)

Normal Imagination: 28.88+23, 883=52.766 (range 28.883% and 52.766%)

Strong Imagination: 52.766% value and above.

Visual images obtained from children's drawings identified 37 imagistic elements at 5% and above. According to the results obtained from coding the visual section data, children most frequently used 'focal point' imagistic elements in their mental map drawings of the city. The three most important imagistic elements in their drawings regarding the city were Meydan (District) with a frequency of 111, Forum Shopping Center (Node) with a frequency of 73, and Uzun Street (Path) with a frequency of 50. The least retained imagistic element in their minds was Sümela Monastery (Landmark) with a frequency of 10. The most frequently used imagistic elements in participants' drawn mental maps are symbolically presented in Figure 5 based on their rates of imagery.

Ratio analysis based on visual data images, observed at 5% and above, classified imagery levels into three intervals: weak, normal, and strong imagery:

Flat Rate: 56.77−5=51.77/3=17.256

Weak Imagination: 5+17,256=22,256 (range 5% and 22,256%)

Normal Imagination: 22,256+17,256=39,512 (range 22,256 and 39,512)

Strong Imagination: 39.512% value and above (Table 3).

The answers to the research questions were evaluated based on the code relationship map obtained from the analysis of research data in the MAXQDA program and Spearman correlation analysis. During this evaluation, the relationships between 5 fundamental elements of the city image (Path, Edge, Landmark, District and Node element) with the variables were examined separately (Table 4, 5).

According to the correlation coefficients between the natural environment and paths (r=0.118, N=256), edges (r=0.045, N=256), and nodes (r=0.153, N=256), it was determined that there is a very weak and positive relationship (Table 4). As seen in the code relationship map, the natural environment is spatially distant from paths, edges, and nodes. This indicates that there is no similar directional relationship between the natural environment and paths, edges, and nodes. When examining the correlation coefficient between the natural environment and landmarks, it was observed that there is a weak and positive relationship (r=0.239, N=256) between these two variables (Table 5). As seen in the code relationship map, landmarks and the natural environment are spatially distant from each other (Fig. 6). This confirms that there is no similar directional relationship between landmarks and the natural environment. When examining the correlation coefficient between the natural environment and districts, it was observed that there is a low-level and positive relationship (r=0.310, N=256) between these two variables (Table 5). As seen in the code relationship map, districts and the natural environment are spatially distant from each other (Fig. 6). This indicates that there is no similar directional relationship between districts and the natural environment.

According to the correlation coefficients between the social environment and edges (r=0.132, N=256) and districts

Table 2. Imagination levels of urban elements imagined according to the verbal section

Ranking	Elements of the city image	Imagination level	Imagination range (%)
1.	Meydan	s	%52,766>
2.	Uzun Street	s	%52,766>
3.	Atatürk Pavilion	s	%52,766>
4.	Ayasofya Museum	s	%52,766>
5.	Forum Shopping Center	s	%52,766>
6.	Black Sea	n	%28,88–%52,766
7.	100. Yıl Park	n	%28,88–%52,766
8.	Seaside	n	%28,88–%52,766
9.	Akçaabat	n	%28,88–%52,766
10.	Değirmendere	n	%28,88–%52,766
11.	Pelitli District	w	%5–%28,883
12.	Meydan Park	w	%5–%28,883
13.	Zağnos Valley	w	%5–%28,883
14.	Maçka	w	%5–%28,883
15.	Varlıbaş Shopping Center	w	%5–%28,883
16.	Kahramanmaraş Street	w	%5–%28,883
17.	Kanuni House	w	%5–%28,883
18.	Çömlekçi	w	%5–%28,883
19.	Beşirli District	w	%5–%28,883
20.	Trabzon Castle	w	%5–%28,883
21.	Beşirli Seaside	w	%5–%28,883
22.	Sümela Monastery	w	%5–%28,883
23.	Kunduracılar Street	w	%5–%28,883
24.	Botanical Park	w	%5–%28,883
25.	Yomra	w	%5–%28,883
26.	Karlık District	w	%5–%28,883
27.	1 Nolu Beşirli District	w	%5–%28,883
28	Kemeraltı Bazaar	w	%5–%28,883
29	Boztepe	w	%5–%28,883
30	Ecopark	w	%5–%28,883
31.	Çağlayan District	w	%5–%28,883
32.	Moloz	w	%5–%28,883
33.	Şenol Güneş Sports Complex	w	%5–%28,883
34.	Atapark	w	%5–%28,883
35.	Tanjant Street	w	%5–%28,883
36.	Kanuni Education and Research Hospital	w	%5–%28,883
37.	Gülbahar Hatun Mosque	w	%5–%28,883
38.	Trabzon International Airport	w	%5–%28,883
39.	Uzungöl	w	%5–%28,883

Weak Imagination: %5–%28,883; Normal Imagination: %28,883–%52,766,

Strong Imagination: %52,799>

s: Strong Imagination; n: Normal Imagination; w: Weak Imagination.

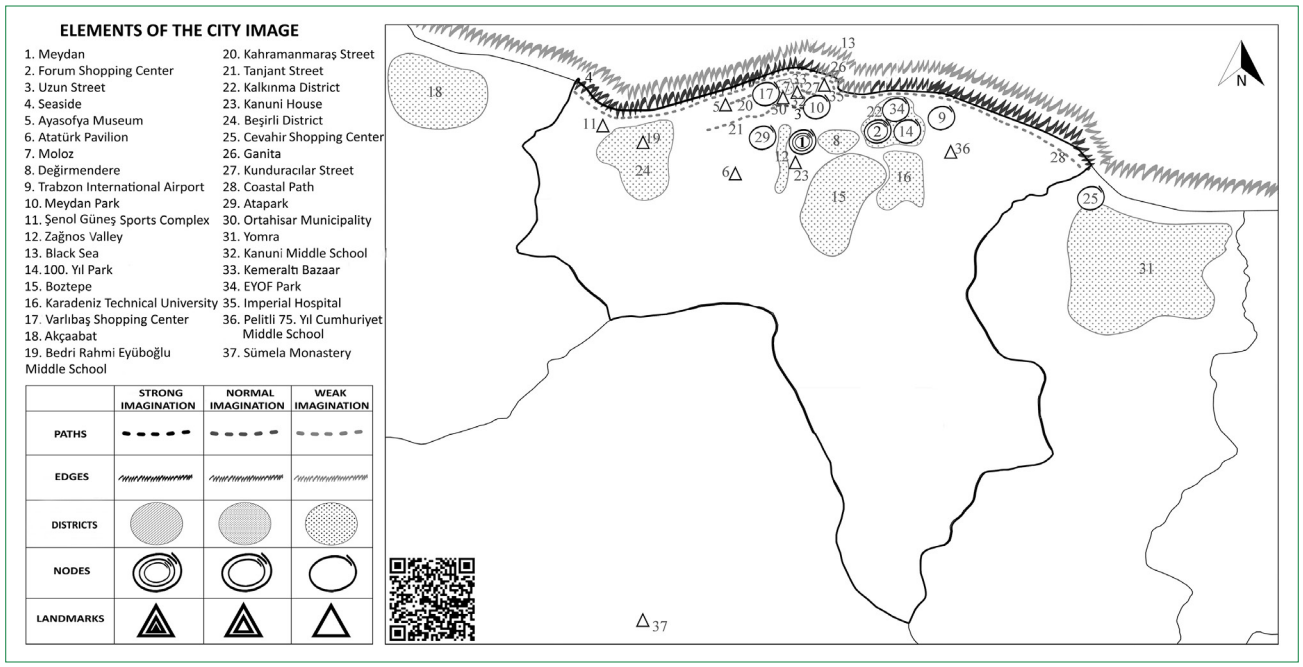

Figure 5. Visual image map.

(r=0.135, N=256), a very weak and positive relationship was determined (Table 5). As seen in the code relationship map, the social environment is spatially distant from edges and districts. Thus, there is no similar directional relationship between the natural environment and paths, edges, and nodes. When examining the correlation coefficient between the social environment and nodes, it was observed that there is a weak and positive relationship (r=0.220, N=256) between these two variables (Table 4). In the code relationship map, it is seen that nodes and the social environment are relatively distant from each other spatially (Fig. 6). This indicates that there is a slight similar directional relationship between nodes and the social environment, but the level of significance is not high enough. According to the correlation coefficients between the social environment and paths (r=0.503, N=256) and landmarks (r=0.379, N=256), a moderate and positive relationship was determined (Table 4). When the code relationship map of the natural environment and paths is examined, it is seen that they are spatially close and the line between them is thick (Fig. 6). This confirms that there is a similar directional relationship between paths and the social environment. However, in the code relationship map of the social environment and landmarks, it is seen that they are relatively distant from each other spatially, confirming that the relationship between them is not very strong (Fig. 6).

When examining the correlation coefficient between the historical environment and nodes, it was observed that there is a very weak and positive relationship (r=0.097, N=256) between these two variables (Table 4). As seen in the code relationship map, nodes and the historical environment are spatially distant from each other (Fig. 6). This indicates that there is no similar directional relationship between nodes and the historical environment. According to the correlation coefficients between the historical environment and paths (r=0.216, N=256), edges (r=0.256, N=256), and districts (r=0.187, N=256), a weak and positive relationship was determined (Table 4). As seen in the code relationship map, the historical environment is spatially distant from paths, edges, and districts (Fig. 6). This confirms that there is no similar directional relationship between these variables. When examining the correlation coefficient between landmarks and the historical environment, it was observed that there is a strong and positive relationship (r=0.744, N=256) between these two variables (Table 4). As seen in the code relationship map, landmarks and the historical environment are spatially close to each other (Fig. 6). This confirms that there is a similar directional relationship between landmarks and the historical environment.

According to the correlation coefficients between perceived safe space and paths (r=0.150, N=256) and edges (r=0.055, N=256), a very weak and positive relationship was determined (Table 4). As seen in the code relationship map, perceived safe space is spatially distant from paths and edges. Thus, there is no similar directional relationship between perceived safe space and paths and edges. According to the correlation coefficients between perceived safe space and districts (r=0.179, N=256), nodes (r=0.191, N=256), and landmarks (r=0.160, N=256), a weak and positive relationship was determined (Table 4). As seen in the code relationship map, perceived

Table 3. Imagination levels of urban elements imagined according to visual section

Ranking	Elements of the city image	Imagination level	Imagination range (%)
1.	Meydan	s	%39,512>
2.	Forum Shopping Center	n	%22,256–%39,512
3.	Uzun Street	n	%22,256–%39,512
4.	Seaside	n	%22,256–%39,512
5.	Ayasofya Museum	w	%5–%22,256
6.	Atatürk Pavilion	w	%5–%22,256
7.	Moloz	w	%5–%22,256
8.	Değirmendere	w	%5–%22,256
9.	Trabzon International Airport	w	%5–%22,256
10.	Meydan Park	w	%5–%22,256
11.	Şenol Güneş Sports Çomplex	w	%5–%22,256
12.	Zağnos Valley	w	%5–%22,256
13.	Blaçk Sea	w	%5–%22,256
14.	100. Yıl Park	w	%5–%22,256
15.	Boztepe	w	%5–%22,256
16.	Karadeniz Technical University	w	%5–%22,256
17.	Varlıbaş Shopping Center	w	%5–%22,256
18.	Akçaabat	w	%5–%22,256
19.	Bedri Rahmi Eyüboğlu Middle School	w	%5–%22,256
20.	Kahramanmaraş Street	w	%5–%22,256
21.	Tanjant Street	w	%5–%22,256
22.	Kalkınma District	w	%5–%22,256
23.	Kanuni House	w	%5–%22,256
24.	Beşirli District	w	%5–%22,256
25.	Cevahir Shopping Center	w	%5–%22,256
26.	Ganita	w	%5–%22,256
27.	Kunduracılar Street	w	%5–%22,256
28.	Coastal Path	w	%5–%22,256
29.	Atapark	w	%5–%22,256
30.	Ortahisar Municipality	w	%5–%22,256
31.	Yomra	w	%5–%22,256
32.	Kanuni Middle School	w	%5–%22,256
33.	Kemeraltı Bazaar	w	%5–%22,256
34.	EYOF Park	w	%5–%22,256
35.	Imperial Hospital	w	%5–%22,256
36.	Pelitli 75. Yıl Cumhuriyet Middle School	w	%5–%22,256
37.	Sümela Monastery	w	%5–%22,256

Weak Imagination: %5–%22,256; Normal Imagination: %22,256–%39,512

Strong Imagination: %39,512>

s: Strong Imagination; n: Normal Imagination; w: Weak Imagination

Table 4. Verbal section Spearman correlation analysis

	Path	Edge	District	Node	Landmark	Natural environment	Social environment	Historical environment	A safe perceived place	A space perceived unsafe
Path	1	0,151 (p=0,0077) N=256	0,007 (p=0,4570) N=256	0,062 (p=0,1614) N=256	0,226 (p=0,0001) N=256	0,118 (p=0,0295) N=256	0,503 (p=0,0000) N=256	0,216 (p=0,0002) N=256	0,150 (p=0,0082) N=256	0,136 (p=0,0147) N=256
Edge	0,151 (p=0,0077) N=256	1	0,204 (p=0,0005) N=256	-0,098 (p=0,0580) N=256	0,251 (p=0,0000) N=256	0,045 (p=0,2392) N=256	0,132 (p=0,0175) N=256	0,256 (p=0,0000) N=256	0,055 (p=0,1920) N=256	0,104 (p=0,0477) N=256
District	0,007 (p=0,4570) N=256	0,204 (p=0,0005) N=256	1	-0,209 (p=0,0004) N=256	0,093 (p=0,0700) N=256	0,310 (p=0,0000) N=256	0,135 (p=0,0155) N=256	0,187 (p=0,0014) N=256	0,179 (p=0,0021) N=256	0,094 (p=0,0669) N=256
Node	0,062 (p=0,1614) N=256	-0,098 (p=0,0580) N=256	-0,209 (p=0,0004) N=256	1	0,049 (p=0,2176) N=256	0,153 (p=0,0071) N=256	0,220 (p=0,0002) N=256	0,097 (p=0,0609) N=256	0,191 (p=0,0011) N=256	0,228 (p=0,0001) N=256
Landmark	0,226 (p=0,0001) N=256	0,251 (p=0,0000) N=256	0,093 (p=0,0700) N=256	0,049 (p=0,2176) N=256	1	0,239 (p=0,0001) N=256	0,379 (p=0,0000) N=256	0,744 (p=0,0000) N=256	0,160 (p=0,0053) N=256	0,212 (p=0,0003) N=256
Natural environment	0,118 (p=0,0295) N=256	0,045 (p=0,2392) N=256	0,310 (p=0,0000) N=256	0,153 (p=0,0071) N=256	0,239 (p=0,0001) N=256	1	0,269 (p=0,0000) N=256	0,212 (p=0,0003) N=256	0,204 (p=0,0005) N=256	0,166 (p=0,0039) N=256
Social environment	0,503 (p=0,0000) N=256	0,132 (p=0,0175) N=256	0,135 (p=0,0155) N=256	0,220 (p=0,0002) N=256	0,379 (p=0,0000) N=256	0,269 (p=0,0000) N=256	1	0,318 (p=0,0000) N=256	0,187 (p=0,0013) N=256	0,193 (p=0,0010) N=256
Historical environment	0,216 (p=0,0002) N=256	0,256 (p=0,0000) N=256	0,187 (p=0,0014) N=256	0,097 (p=0,0609) N=256	0,744 (p=0,0000) N=256	0,212 (p=0,0003) N=256	0,318 (p=0,0000) N=256	1	0,127 (p=0,0211) N=256	0,194 (p=0,0009) N=256
A safe perceived place	0,150 (p=0,0082) N=256	0,055 (p=0,1920) N=256	0,179 (p=0,0021) N=256	0,191 (p=0,0011) N=256	0,160 (p=0,0053) N=256	0,204 (p=0,0005) N=256	0,187 (p=0,0013) N=256	0,127 (p=0,0211) N=256	1	0,214 (p=0,0003) N=256
A space perceived unsafe	0,136 (p=0,0147) N=256	0,104 (p=0,0477) N=256	0,094 (p=0,0669) N=256	0,228 (p=0,0001) N=256	0,212 (p=0,0003) N=256	0,166 (p=0,0039) N=256	0,193 (p=0,0010) N=256	0,194 (p=0,0009) N=256	0,214 (p=0,0003) N=256	1

Table 5. Visual section Spearman correlation analysis

	Path	Edge	District	Node	Landmark	Natural environment	Social environment	Historical environment
Path	–	0,129 (p=0,0374) N=191	-0,024 (p=0,3713) N=191	0,094 (p=0,0988) N=191	0,133 (p=0,0333) N=191	-0,027 (p=0,3539) N=191	0,412 (p=0,0000) N=191	0,051 (p=0,2432) N=191
Edge	0,129 (p=0,0374) N=191	–	0,162 (p=0,0125) N=191	0,321 (p=0,0000) N=191	0,151 (p=0,0187) N=191	0,245 (p=0,0003) N=191	0,279 (p=0,0000) N=191	0,236 (p=0,0005) N=191
District	-0,024 (p=0,3713) N=191	0,162 (p=0,0125) N=191	–	0,326 (p=0,0000) N=191	0,079 (p=0,1379) N=191	0,389 (p=0,0000) N=191	0,215 (p=0,0014) N=191	0,201 (p=0,0026) N=191
Node	0,094 (p=0,0988) N=191	0,321 (p=0,0000) N=191	0,326 (p=0,0000) N=191	–	0,259 (p=0,0001) N=191	0,569 (p=0,0000) N=191	0,636 (p=0,0000) N=191	0,316 (p=0,0000) N=191
Landmark	0,133 (p=0,0333) N=191	0,151 (p=0,0187) N=191	0,079 (p=0,1379) N=191	0,259 (p=0,0001) N=191	–	0,297 (p=0,0000) N=191	0,375 (p=0,0000) N=191	0,466 (p=0,0000) N=191
Natural environment	-0,027 (p=0,3539) N=191	0,245 (p=0,0003) N=191	0,389 (p=0,0000) N=191	0,569 (p=0,0000) N=191	0,297 (p=0,0000) N=191	–	0,371 (p=0,0000) N=191	0,380 (p=0,0000) N=191
Social environment	0,412 (p=0,0000) N=191	0,279 (p=0,0000) N=191	0,215 (p=0,0014) N=191	0,636 (p=0,0000) N=191	0,375 (p=0,0000) N=191	0,371 (p=0,0000) N=191	–	0,290 (p=0,0000) N=191
Historical environment	0,051 (p=0,2432) N=191	0,236 (p=0,0005) N=191	0,201 (p=0,0026) N=191	0,316 (p=0,0000) N=191	0,466 (p=0,0000) N=191	0,380 (p=0,0000) N=191	0,290 (p=0,0000) N=191	–

safe space is spatially distant from districts, nodes, and landmarks. Thus, there is no similar directional relationship between perceived safe space and districts, nodes, and landmarks.

According to the correlation coefficients between perceived unsafe space and paths (r=0.136, N=256), edges (r=0.104, N=256), and districts (r=0.094, N=256), a very weak and positive relationship was determined (Table 4). As seen in the code relationship map, perceived unsafe space is spatially distant from paths and edges. This confirms that there is no similar directional relationship between perceived unsafe space and paths, edges, and districts. According to the correlation coefficients between perceived unsafe space and nodes (r=0.228, N=256) and landmarks (r=0.212, N=256), a weak and positive relationship was determined (Table 4). As seen in the code relationship map, perceived unsafe space is spatially distant from nodes and landmarks (Fig. 6). This confirms that there is no similar directional relationship between perceived unsafe space and districts.

When examining the correlation coefficient between the natural environment and paths, it was determined that there is a very weak and negative relationship (r=-0.027, N=192) between these two variables (Table 5). As seen in the code relationship map, the natural environment and paths are spatially quite distant from each other (Fig. 7). This indicates that there is no similar directional relationship between paths and the natural environment.

According to the correlation coefficients between the natural environment and edges (r=0.245, N=192) and landmarks (r=0.297, N=192), it was determined that there is a weak and positive relationship (Table 5). As seen in the code relationship map, the natural environment is spatially distant from edges and landmarks (Fig. 7). This confirms that there is no similar directional relationship between the natural environment and edges and landmarks.

When examining the correlation coefficient between the natural environment and districts, it was observed that there is a low-level and positive relationship (r=0.389, N=192) between these two variables (Table 5). In the code relationship map, it is seen that the natural environment and districts are relatively distant from each other spatially (Fig. 7). This

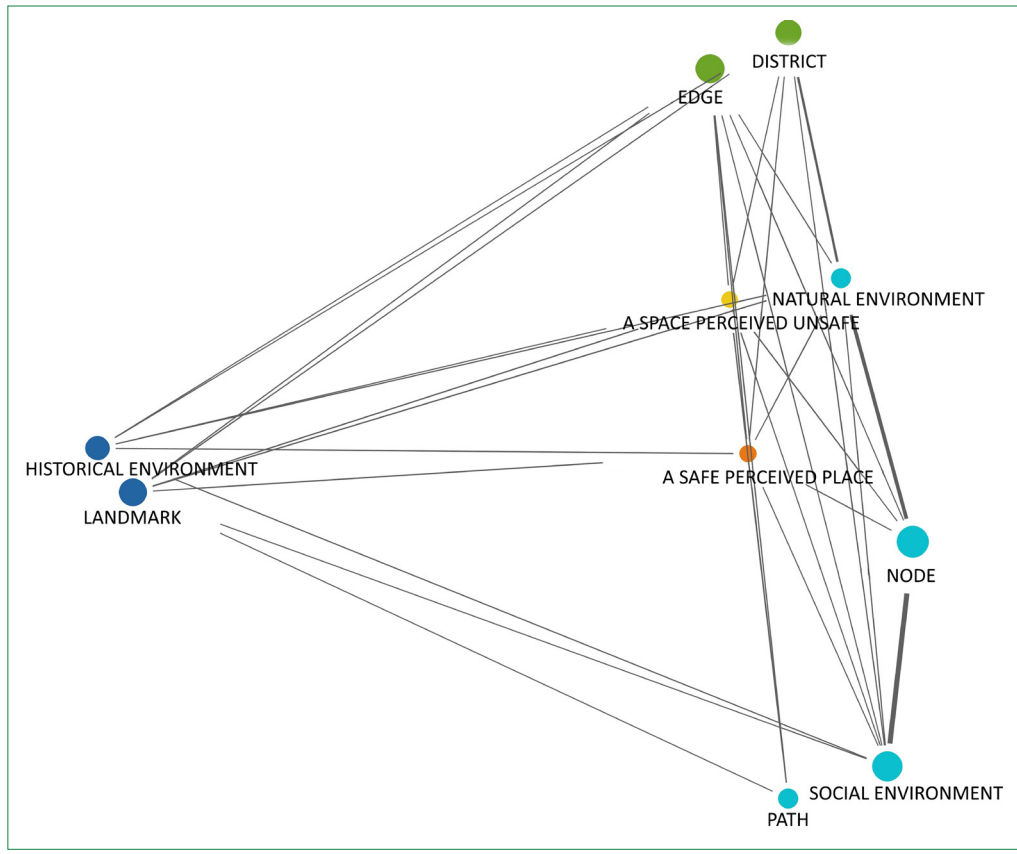

Figure 6. Verbal segment code relationships map.

indicates that there is a slight similar directional relationship between the natural environment and districts, but the level of significance is not sufficient.

When examining the correlation coefficient between the natural environment and nodes, it was observed that there is a moderate and positive relationship (r=0.569, N=192) between these two variables (Table 5). As seen in the code relationship map, the natural environment and nodes are spatially close to each other (Fig. 7). This indicates that there is a similar directional relationship between the natural environment and nodes.

According to the correlation coefficients between the social environment and edges (r=0.279, N=192) and districts (r=0.215, N=192), it was determined that there is a weak and positive relationship (Table 5). As seen in the code relationship map, the social environment is relatively distant from edges, but the thickness of the line between them is low (Fig. 7). This indicates that there is a slight similar directional relationship between edges and the social environment, but the level of significance is not sufficient. On the other hand, the social environment and districts are spatially distant from each other (Fig. 7). This indicates that there is no similar directional relationship between the social environment and districts.

According to the correlation coefficients between the social environment and paths (r=0.412, N=192) and landmarks (r=0.375, N=192), it was determined that there is a low-level and positive relationship (Table 5). As seen in the code relationship map, the line between the social environment and paths and landmarks is distinctly thick (Fig. 7). This indicates that there is a similar directional relationship between the social environment and paths and landmarks.

When examining the correlation coefficient between the social environment and nodes, it was observed that there is a moderate and positive relationship (r=0.636, N=192) between these two variables (Table 5). As seen in the code relationship map, the social environment and nodes are relatively close to each other, and the line between them is distinctly thick (Fig. 7). This indicates that there is a similar directional relationship between the social environment and nodes.

When examining the correlation coefficient between the historical environment and paths, it was determined that there is a very weak and positive relationship (r=0.051, N=192) between these two variables (Table 5). As seen in the code relationship map, the historical environment and paths are spatially distant from each other (Fig. 7). This indicates that there is no similar directional relationship between the historical environment and paths.

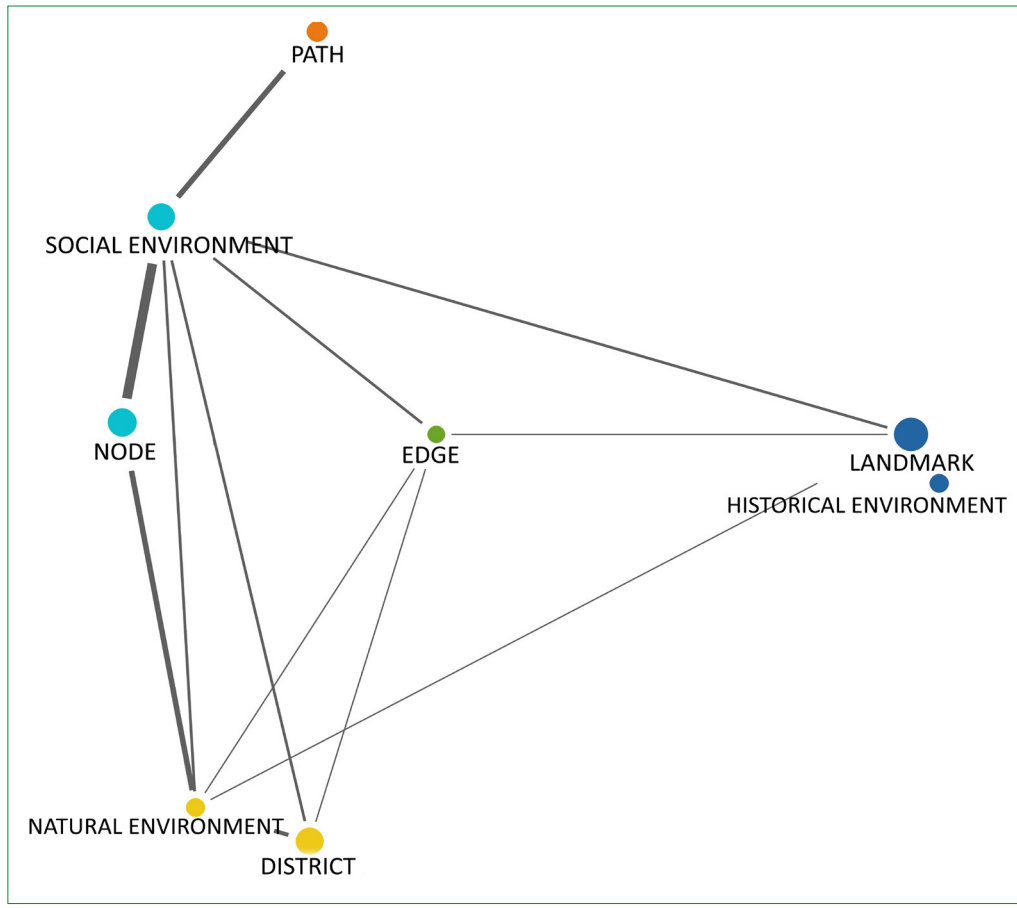

Figure 7. Visual section code relationships map.

According to the correlation coefficients between the historical environment and edges (r=0.236, N=192) and districts (r=0.201, N=192), it was determined that there is a weak and positive relationship (Table 5). As seen in the code relationship map, the historical environment is relatively distant from edges and districts, but the thickness of the line between them is low (Fig. 7).

According to the correlation coefficients between the historical environment and nodes (r=0.316, N=192) and landmarks (r=0.466, N=192), it was determined that there is a low-level and positive relationship (Table 5). As seen in the code relationship map, the historical environment is spatially close to landmarks and nodes (Fig. 7). This indicates that there is a slight similar directional relationship between the historical environment and landmarks and nodes, but the level of significance is not sufficient.

4. Conclusions and Suggestions

This study aims to reveal children's urban perceptions through the urban image, focusing on children, a special group with a significant population size in cities. Surveys and mental mapping studies were conducted with children aged 10–12 in the Ortahisar district of Trabzon. Following the developed theoretical framework, an evaluation of the findings identified in the field study was conducted. The conclusion section was addressed in line with the initial research questions and concluded with general evaluations and recommendations based on the findings obtained.

When examining the relationship between the elements of the city image (paths, edges, districts, nodes, and landmarks) obtained from the survey forms completed by participants and the drawn mental maps with the natural, social, and historical environments; According to the survey findings conducted with 10, 11, and 12-year-old children in six different schools; when examining the relationship between elements of the city image and the natural environment, a weak relationship was found between them. This result can be explained by the fact that the city's mountainous and green characteristic structure is not perceived as different by children. According to mental map findings, a correlated relationship was established only between nodes and the natural environment. Therefore, we can say that children generally spend time in parks with natural environment qualities, and this becomes a permanent element in their

minds. Considering the importance of early relationships with nature for children, improving nodes in natural environments should be a focus for local governments.

According to the survey findings, a correlated relationship was found between the social environment and paths, nodes, and landmarks. Mental map findings showed a correlated relationship between edges, nodes, and the social environment. Social spaces where children frequently spend time with their families or friends have left a significant impact on their minds. The coastal areas forming the edges and other public spaces forming the nodes, landmarks used for location and meeting points are seen as important areas for socialization and spatial improvements.

When examining the relationship between elements of the city image and the historical environment based on survey and mental map findings, a correlated relationship was found only with landmarks. Thus, it is possible to say that children define the historical structures of the city as landmarks and give them a permanent place in their minds. All activities needed to protect and further promote the historical values that are quite permanent in children's minds should be increased.

The relationship between natural, social, and historical environments is predominantly shaped by the dominance of the social environment. In other words, social environments have gained significant importance in children's urban image perception. Therefore, areas where children frequently spend time socially or visit often stand out as dominant elements in their minds. Improving urban spaces to strengthen children's relationships with the natural, social, and historical environments will allow for better relationships between children and the city.

When examining the relationship between the elements of the city image obtained from the survey forms completed by participants and the perception of safe and unsafe spaces; A very weak and positive relationship was found between safe perceived spaces and paths and edges; however, this relationship was not similar in terms of spatial positioning. Similarly, a weak and positive relationship was found between safe perceived spaces and districts, nodes, and landmarks, but these elements did not show spatial compatibility with the perception of safe spaces. Although a very weak and positive relationship was found between unsafe perceived spaces and paths, edges, and districts, no similar directional relationship was observed between these elements and the perception of unsafe spaces. On the other hand, a weak and positive relationship was found between unsafe perceived spaces and nodes and landmarks, but these elements were spatially distant from each other. These findings reveal that the relationships between the perception of safe and unsafe spaces and elements of the city image are complex and spatially incompatible. Therefore, it is concluded that these elements alone are not sufficient in shaping children's space perceptions and forming an urban image, and a more comprehensive and multi-dimensional approach is necessary.

When examining the verbal image map obtained from the verbal section and the visual image map obtained from the visual section, it can be said that the northern part of the city is generally found to be significant for children. When examining the natural environment images related to the verbal and visual sections, 100. Yıl Park and Zağnos Valley; when examining the social environment images, Forum Shopping Center and Uzun Street; and when examining the historical environment images, Atatürk Mansion and Ayasofya Mosque were the most frequently used elements of the city image by the participants.

Based on the findings obtained from the studies in general, differences were identified between the verbal and visual sections. Elements of the city image were used more frequently in the verbal section by children. Thus, while children used more general expressions in their drawings, they used more elements of the city image when answering survey questions. The aim is to use the obtained results to include children in the urban design and planning process and to contribute to the literature. Although there are limited similar studies in Turkey, image studies specifically focusing on children are almost nonexistent. Conducting the study in the city of Trabzon is significant in providing input for the city's planning and design process. Based on the findings from the research, mental maps can be used as a tool to ensure children's participation in planning. Drawing pictures or maps is a method of conveying information that children enjoy. Unlike methods such as surveys and interviews, map drawing is a direct method of conveying information obtained from the child without any guiding element. Therefore, it is a tool that allows us to directly access children's views by obtaining information about the space from them.

In summary, this study contributes to the literature by examining children's perception of space through elements of the city image. For future studies, a more balanced selection of the sample group, including an equal number of participants in terms of gender and age group distribution from randomly selected schools in a grid system, can be made to ensure equal participation of students from the studied schools. Based on all these outputs, it is recommended to re-evaluate the physical environments in which children live holistically to support their needs, perceptual development, and to ensure that children become stakeholders in the planning discipline.

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