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Measuring the Perception of Visual Quality in a Coastal Park: Akyazı Coastal Park (Ordu-Turkey) *

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Abstract
The aim of this study is to identify the factors that influence individuals' perception of visual quality in a coastal park. To achieve this, a visual questionnaire was conducted among students who frequently visit the park. The data collected was analysed using statistical methods. The study concluded that gender does not significantly affect visual quality perception. Additionally, there was no difference in visual quality perception between participants who live by the sea and those who do not. However, the number of years that participants have lived in the city does have a relative impact on their perception of visual quality. The study found that visual quality perception remained relatively stable for those living in the city for up to 2 years but increased for those living in the city between 2 and 3 years. However, for those living more than 3 years, the perception of visual quality then gradually decreased.

Keywords: *Visual Quality, Visual Perception, Coastal Park, Akyazi, Recreation*

*Ethics Committee Approval of this study has been taken from Ordu University Social and Human Sciences Ethics Committee with decision number 2024-72 and dated 02/05/2024.

1. Introduction

Urban parks, including coastal parks, are areas that contribute to ecological balance and play an important role in sustainable urban development by improving quality of life (Li, 2022; Xiang et al., 2022). Coastal parks provide recreational opportunities, encourage physical activity and provide space for individuals to interact and socialize (Xie et al., 2018; Malik et al., 2020). They contribute to urban livability by meeting the recreation needs of urban residents and promoting equal access to green spaces for all (Huang & Huang, 2019; Luo et al., 2020). In addition to their social and recreational impacts, coastal parks, like all other urban green spaces, improve the thermal environment in cities by reducing the urban heat island effect (Othman et al., 2019; Zhang et al., 2022). In addition, coastal parks, which serve as transition zones between land and marine ecosystems, support biodiversity (Dallimer et al., 2012; Pittman et al., 2019; Lin & Qiu, 2022).

The relationship between urban green spaces and visual perception has an important place in urban planning (Cheng et al., 2017). Visual perception, which is defined as the process of getting information from the environment, is expressed by concepts such as beauty, satisfaction and aesthetics related to the space (Daniel, 2001; Kiper et al., 2017). Studies have shown that the visual attractiveness of urban green spaces contributes to the quality of life and satisfaction of individuals using these spaces (Man et al., 2022). The visual quality of urban green spaces, including coastal parks, is seen as a critical element that can reduce the stress level of visitors and increase their overall satisfaction levels by promoting a sense of well-being (Danjaji et al., 2018; Türkoğlu & Seçmen, 2019). It is crucial to understand the visual perceptions and attitudes of individuals using urban green spaces in order to produce effective urban planning and landscape designs (Çelik & Jaiyeoba, 2023). Research on this subject emphasizes the importance of visual quality perception in increasing visitor satisfaction. Although visual quality perception is directly related to visitor satisfaction, it is also important in terms of environmental sustainability. Research shows that people's aesthetic preferences significantly affect how they perceive and interact with their environment (Palmer et al., 2013). The visual and aesthetic attractiveness of a place can affect people's emotional and physical ties with that place and cause individuals to prefer to live in a specific location (Marshall et al., 2018). The frequency of preference of visually superior places by visitors may increase (Kiper et al., 2017). For this reason, aesthetically and visually appealing places are more likely to be valued and cared by those who use that space (Akadiri et al., 2012).

In this study, it is questioned whether gender differences, the number of years individuals have lived in the city, and whether the cities where individuals were born and raised are located by the sea are effective on individuals' perception of visual quality. In addition to these general objectives, the question "Does the perception of visual quality show homogeneity throughout a linear coastal park?" is also sought to be answered in the coastal park scale. In research focusing on visual quality perception, various methods are used to assess overall landscape quality and aesthetic attractiveness. These methods include direct or indirect assessment methods such as visual landscape assessment, eye tracking tests, landscape valuation techniques, composition assessment (Dupont et al., 2015; Loures et al., 2015; Costa & Lampert, 2018; Gyurkovich & Pieczara, 2021; Wang et al., 2021). Since visual assessment methods facilitate understanding how individuals perceive and interact with different landscapes, they provide important information that can guide landscape planning processes (Dupont et al., 2015; Gyurkovich & Pieczara, 2021; Wang et al., 2021). Visual questionnaires based on specific photographs of the study areas are a powerful tool for identifying public landscape preferences. However, there are ongoing debates about the reliability and validity of using photographs in studies focusing on visual quality perception (Chien et al., 2021). GIS and remote sensing data and the results of surveys and social studies are very important in assessing the visual quality of landscapes and revealing the visual perception of people (Marti et al., 2020; Sowińska-Świerkosz & Michalik-Śnieżek, 2020). Through these methods, subjective assessments of landscapes can be collected, while at the same time a more comprehensive approach can be put forward as biological and physical-based assessments defined by experts can be made (Wu et al., 2006).

In order to improve the management, planning and design of coastal parks, there is a need for research that assesses the perception of visual quality from a multifaceted perspective. This type of research provides unique insights into how visitors visually perceive and interact with a coastal park. Understanding the complex relationship between visual landscape quality in coastal parks and visitors' experiences will lead to improvements in the design features and maintenance processes of parks (Sadana, 2016; Çilek, 2023). Understanding Park visitors' preferences for various landscape design elements can help designers to create more visually attractive and user-friendly spaces (Polat & Akay, 2015). Analyzing the visual perception of urban green spaces can play an important role in improving the quality of these spaces (Güneroğlu & Bekar, 2022). Increased visual and functional quality of green spaces can help to attract more visitors and improve visitors' experiences in these spaces (Liu & Xiao, 2020). In summary, research on the perception of visual quality in coastal parks should be carried out in a way that can provide important information for decision-making processes, improve visitor experiences and contribute to the sustainable development of these spaces.

The study focuses on Akyazi Coastal Park, which is located in Ordu city center and is one of the important urban green spaces. Located on the Black Sea coast, the park continues along Akyazi neighborhood. The park, which includes the beach and green space, is one of the important recreation areas that meet the recreation needs of people living in the city center. The study mainly deals with the visual quality perceptions of undergraduate and graduate students studying in the field of landscape architecture. In this study, it is aimed to determine the factors affecting the visual quality perception of individuals in the case of a coastal park. For this purpose, a visual-based questionnaire was prepared and then applied to students who actively use the coastal park.

2. Materials and Methodology

In this section, information about the study area, questionnaire application and statistical analysis and data visualization is given.

2.1. Study area

The study was conducted in the Akyazi Coastal Park, which is located in Ordu city center, on the Black Sea coast and continues along the Akyazi neighbourhood (Figure 1). The coastal park continues for approximately 1.9 km. The width of the park varies between 2.7 m and 43 m, excluding the beach, pedestrian and bicycle path. Within the park, there are landscape elements such as seating areas, children's playgrounds, restaurant, buffets, bicycle renting stations, indoor seating units and a pool. In order to answer one of the research questions of the study, "Does the perception of visual quality differ in different parts of the coastal park?", the coastal park was divided into 5 sections based on linear length (Figure 2).

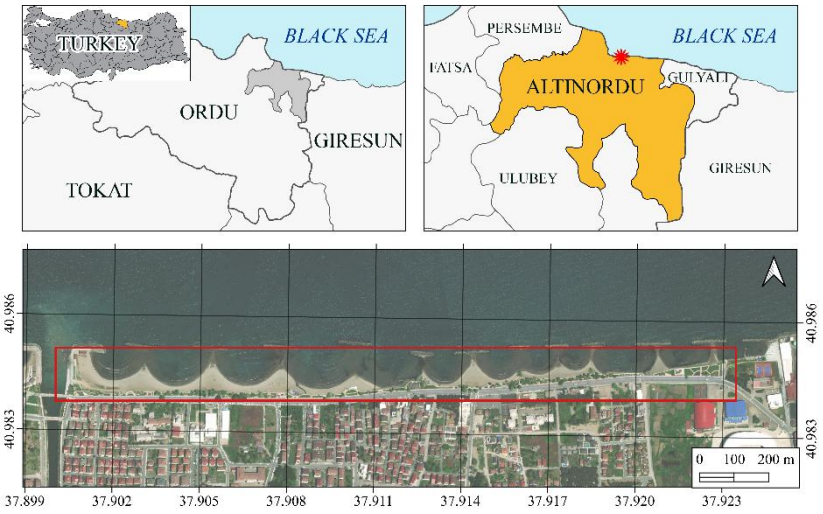

Figure 1. Location of Study Area

Figure 2. Sections of the Akyazı Coastal Park

2.2. Questionnaire Application

In the study, data were collected through a visual-based questionnaire application. Photographs sampled from the study area were randomly shown to the questionnaire participants and they were asked to score the relevant photographs between 1 and 5 in line with specific criteria. A total of 25 photographs of 5 sections of the park were selected from a total of 300 photographs taken in the study area. In the selection of the photographs, attention was given to the best representation of the landscape elements in the study area. The questionnaire was applied online via Google Forms platform. In the first part of the questionnaire; the gender of the participants, their years of living in Ordu city and whether their hometown is located by the sea were asked. In the second part, the participants were shown photographs of various parts of the coastal park and asked to give a score between 1 (very low) and 5 (very high) for each of the visual quality parameters in Table 1.

Table 1. Parameters to be Evaluated for the Photographs in the Questionnaire and their Definitions

Parameter	Abbreviation	Description
Scenic Beauty	SB	Perceived scenic attractiveness and level of preference
Integrity/Harmony	IH	The visual effect created by the combination of landscape elements
Naturalness	NT	The level of naturalness or natural appearance of landscape elements
Plant Design	PD	The level of pleasure that the plants in the landscape create in people
Colour Variety	CV	The variety of colours in the landscape and the combination of different colours
Surface Material	SM	Level of diversity and permeability of surface materials
Furniture Material	FM	The suitability of the materials of urban outdoor furniture and the level of harmony with other materials

The questionnaire application was carried out with undergraduate and graduate students at Ordu University, Faculty of Agriculture, Department of Landscape Architecture. Before the questionnaire, the participants were informed about the subject of the study and it was explained how the scoring would be done. The data obtained as a result of the questionnaire were downloaded from Google Forms platform in .csv format and were prepared for statistical analysis.

2.3. Statistical Analysis and Data Visualization

The variation of the visual quality parameter means obtained by the questionnaire method according to various groups of variables was evaluated by using statistical methods. The normal distribution condition of the groups in the data set is determinative in selecting the most appropriate method. Therefore, the normality of the data was checked by Shapiro-Wilk test (Shapiro & Wilk, 1965). Since the data used in the study were normally distributed, one-way analysis of variance (One-way ANOVA) was used when comparing three or more group means, and independent sample T-test was used when comparing two

group means. RStudio 2023.12.1 Build 402 and Jamovi 2.4.11 software was used to perform statistical analyses and visualize the data (R Core Team, 2024; The Jamovi Project, 2024; Wickham, 2016).

3. Results and Discussion

According to the scoring for the visual quality evaluation parameters, the photographs with the lowest and highest means for each parameter were determined (Table 2). The photograph with the lowest score in all parameters and overall mean is P10 with a score of 3 out of 5. Since the cracks in the floor have a very negative visual impact, this may have led the respondents to give low scores in all other parameters. Although the questionnaire participants agreed on the weakest photograph in terms of visual quality, they differed according to the parameters regarding the photographs with the highest visual quality. P17 has the highest mean scores in terms of SB, NT and, CV parameters. In the front view of P17, there are formed shrub groups, palm trees and a walking path; in the back view, there are beach, sea and city landscape. This photograph, which offers a wide view and perspective area, was appreciated by the participants for three parameters.

The photograph with the highest mean in terms of IH, PD and, SM parameters and overall mean is P14. This photograph is quite similar to P17 in terms of capture perspective and contents. In this photograph, there are shaped bushes, deciduous trees, floor material and urban accessories. The calligraphic effect of the trunks of the defoliated trees against the backdrop of the sky and the sea received high scores from the participants both in terms of integrity and harmony and in terms of planting design. The fact that the floor is in harmony with the whole photograph and has a color tone that highlights the green texture caused the participants to give higher scores for the SM parameter. In terms of FM parameter, the highest mean evaluation score belongs to P8. As a result of the fact that the pergola in the photograph is made of wooden material and the perception of naturalness created by wood on people, this photograph has been advantageous in terms of FM parameter.

Table 2. Photographs with the Lowest and Highest Mean Score According to the Visual Quality Evaluation Parameters

Parameter	Lowest mean	Highest mean
SB	 P10 (3.0/5)	 P17 (4.2/5)
IH	 P10 (2.7/5)	 P14 (4.1/5)

Table 2 continued

NT	 P10 (3.0/5)	 P17 (4.0/5)
PD	 P10 (2.6/5)	 P14 (4.1/5)
CV	 P10 (2.4/5)	 P17 (3.5/5)
SM	 P10 (2.0/5)	 P14 (3.5/5)
FM	 P10 (2.4/5)	 P8 (3.5/5)
Overall mean	 P10 (2.6/5)	 P14 (3.8/5)

3.1. Differences in Visual Quality Perception Between Sections of the Coastal Park

Figure 3 presents the seven parameters for visual quality perception and their variation across different sections of the park. Although there are differences in parameter means between different sections of the

park, these differences are not statistically significant. Table 3 provides a summary of the analysis of variance results, explaining the variation in parameter means for visual quality perception across different parts of the park. The analysis indicates that there is no significant difference between the five sections of the park in terms of the means of all variables and the overall mean ($p>0.05$). This suggests that the perception of visual quality is relatively consistent throughout the linear coastal park. The 25 photographs taken from the coastal park show repetitive landscape elements, and there are no notable differences in terms of equipment, materials, and plant design between the sections of the park. This may have contributed to the observed result.

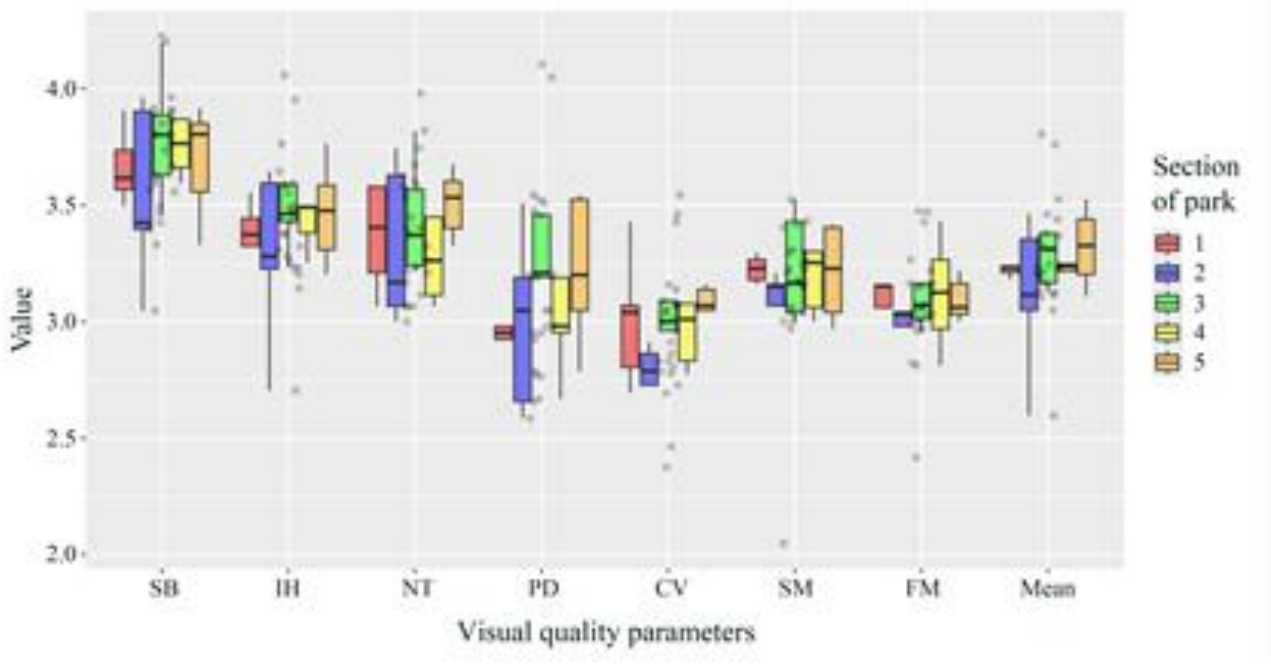

Figure 3. Variation Between Visual Quality Parameters According to the Sections of the Park

Table 3. ANOVA Test Results Showing the Variation of Visual Quality Variable Averages Between the Sections of the Park

	One-way ANOVA test			
Parameter	**F**	**df1**	**df2**	**p**
SB	0.591	4	9.79	0.677
IH	0.620	4	9.72	0.658
NT	0.482	4	9.65	0.749
PD	0.576	4	9.84	0.687
CV	1.752	4	9.58	0.218
SM	0.433	4	8.88	0.782
FM	0.160	4	9.49	0.953
Overall mean	0.544	4	9.01	0.708

3.2. Gender-Visual Quality Perception Relationship

The perception and use of urban green areas are influenced by gender. Studies indicate that men are more likely to use these areas than women, while women tend to avoid green spaces that they perceive as unsafe (Maas et al., 2009; Richardson & Mitchell, 2010). Furthermore, men and women have varying sensitivities and expectations when it comes to urban green spaces (Braçe et al., 2021). However, our study on the coastal park found that gender did not significantly affect the perception of visual quality. Table 4 displays the independent sample T-test results analyzing the differentiation of visual quality parameter means according to the participants' gender. There was no significant difference between men and women in terms of the mean of any parameter. As can be seen, gender alone is not a sufficient factor in determining visual quality perception. Cultural differences can also cause different landscape perceptions (Buijs et al., 2009; Pan et al., 2020).

Table 4. Variation of Visual Quality Parameter Averages According to Gender

	Independent samples T-test				
Parameter	**Statistic**	**df**	**p**	**Mean difference**	**SE difference**
SB	-1.783	106	0.077	-0.2989	0.168
IH	-1.253	106	0.213	-0.2028	0.162
NT	-1.503	106	0.136	-0.2400	0.160
PD	-0.316	106	0.753	-0.0501	0.158
CV	0.767	106	0.445	0.1487	0.194
SM	0.668	106	0.505	0.1513	0.226
FM	0.742	106	0.460	0.1659	0.224
Overall mean	-0.290	106	0.773	-0.0465	0.161

3.3. Relationship Between Duration of Stay in The City and Perception of Visual Quality

The length of time a person resides in a city can affect their visual perception. Urban residents tend to develop a sense of attachment and familiarity with their environment over time (Gür & Sezer, 2018), which can alter their perception of visual elements in the environment, either positively or negatively. Figure 4 shows the relationship between the number of years participants have lived in the city and the scores they gave for visual quality parameters. The results indicate that, for almost all parameters and the overall mean, visual quality perception remained relatively constant for those who had been living in the city for at most 2 years, while it peaked for those who had been living in the city for 2 to 3 years. After 3 years, the visual quality level gradually decreases. It has been concluded that long-term familiarity does not necessarily lead to finding places more attractive or creating a positive visual impression.

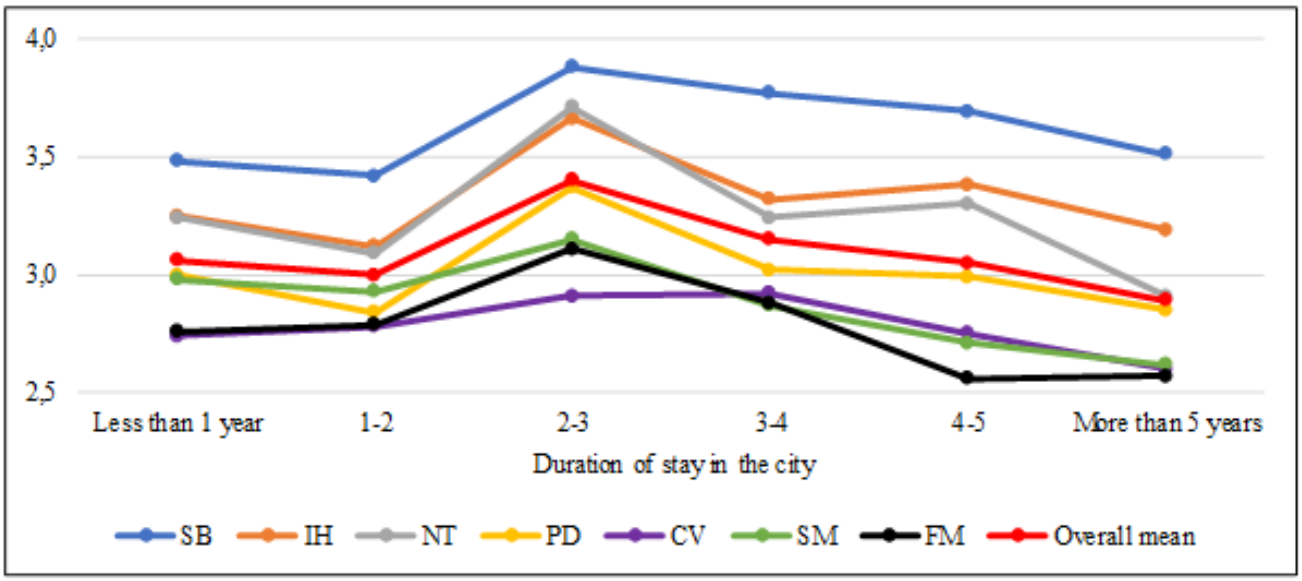

Figure 4. The Relationship Between the Duration of Stay in the City and the Perception of Visual Quality

3.4. Relationship Between Distance of the Hometown to the Seaside and Perception of Visual Quality

Spatial orientation is often influenced by past experiences and perceptions (Huang & Yu, 2012). Therefore, visual quality perception can be influenced by various factors, including environmental experiences and geographical location. For instance, an individual who grew up by the sea may have preconceived notions about coastal parks, which could affect their visual evaluation. Therefore, the study investigated whether there was a relationship between the birthplace of survey participants and their perception of visual quality in a coastal park. An independent sample T-test was performed (Table 5). However, there was no significant difference in visual quality perception between participants from coastal and non-coastal hometowns for all parameters ($p>0.05$).

Table 5. Variation of Visual Quality Parameter Averages According to the Distance of the Participants' Hometown to the Sea

	Independent samples T-test				
Parameter	**Statistic**	**df**	**p**	**Mean difference**	**SE difference**
SB	0.86031	106	0.392	0.14303	0.166
IH	0.56860	106	0.571	0.09079	0.160
NT	0.55834	106	0.578	0.08822	0.158
PD	-0.30695	106	0.759	-0.04770	0.155
CV	-0.01000	106	0.992	-0.00191	0.191
SM	-0.04466	106	0.964	-0.00993	0.222
FM	0.10077	106	0.920	0.02217	0.220
Overall mean	0.25793	106	0.797	0.04067	0.158

4. Conclusion

This study evaluates the visual quality of Akyazi Coastal Park using the visual content questionnaire method to understand how park visitors perceive the landscape. The study found that there were no significant differences in visual quality perceptions based on the gender of university students who actively use the coastal park or whether the city they were born and raised in is located by the sea. Although the duration of people's stay in the city may affect visual quality evaluations, the study's findings do not indicate a significant pattern. The sense of familiarity resulting from living in and experiencing a city, whether long or short-term, did not lead to urban green spaces being found more visually attractive. As the landscape elements were evenly distributed throughout the park, people's evaluations of visual quality did not significantly vary across different sections of the coastal park.

The research offers a scientific basis for local governments and designers on sustainable landscape design and developing strategies to enhance visual quality in the landscape. However, it is important to note that the study's sample size is limited to university students only. Therefore, the results should not be generalized to all individuals who use the coastal park. To obtain more comprehensive results, it is recommended to optimize the sample size and diversify the questionnaire participants in future studies. Vegetation is a crucial component of visual perception in the landscape, and its visual characteristics vary throughout the year. Therefore, evaluations should be conducted in different seasons to provide a broader perspective when determining the visual quality level of coastal parks. This statement paves the way for the development of more effective strategies for designing and managing coastal parks.

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Contribution Rate of Researchers: The study was prepared with the contribution of two authors. Contribution rates; 1. Author = % 40, 2. Author = % 30, 3. Autor: %30.

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