

Complexity, Historicity and Coherence: Preference and Quality of the Changes in the Urban Scene

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ABSTRACT In order to meet the needs and desires of the community and to shape the environment successfully it is important to reveal how we perceive the landscape and the factors that affect our preferences for different landscapes. This study focused on the role of several visual quality concepts, including complexity, coherence and historicity, and on the preference for changing the scenery of a city. To fulfill the objectives of the research, 107 people were asked to evaluate old and new scenes of Trabzon city using these concepts, and their preferences for various scenes were identified. Findings showed that complexity, coherence and historicity have an influence on environmental preferences. An inverse U-shape relationship was found between complexity and preference. The scenes with a medium level of complexity were preferred to the scenes with a higher or lower level of complexity. Coherence and historicity were found to be directly related to preference. In this paper, the general features of complexity, historicity and coherence were considered valid for assessment and preference of the urban scene.

INTRODUCTION

Over the past 40 years, a great number of researchers have performed research on the visual preferences of the environment (Svobodova et al. 2015). Ode et al. (2008) revealed in their studies, in which they evaluated visual quality of rural areas, that people's perception of landscape features have an important impact on their preference. Therefore, in order to determine visual preference, studies carried out on the perceived quality of environment, especially urban environments searched for ways to establish a compatible relationship between people and environment (Kalin and Yilmaz 2012). Hence, many theories have been developed in the visual quality field which explains the landscape preference and perception. These are broadly divided into two as evolutionary theories (Appleton 1975; Kaplan and Kaplan 1989) and cultural preference theories (Tuan 1974; Carlson 2001). In recent years, some researchers have asserted the integrative theoretical framework as an approach which explains the environment perception and preference that may change with cultural experience and personal preferences (Bourassa 1991;

Fry et al. 2009). This approach found that in spite of personal and cultural differences, there are some common landscape features which support the quality and preferability of some environments for people due to their evolutionary history (Fry et al. 2009).

Nowadays, detecting the common landscape features and performing environmental designs accordingly are the issues that need to be given more importance. Urban areas are the subject of the evaluation which has been made with the perceptions of urban environmental features defined by the people. In this context, urban design has to deal the people and their ways of interaction with the city (Aslan and Atik 2015). Destroying nature, unconscious and unplanned housing (Yilmaz et al. 2015) and high-rise and dense buildings (Cetin 2015; Surat and Yaman 2015) cause imbalance between the built environment and natural environment and in decreases in the visual quality value of the environment (Yilmaz et al. 2015). As a result of this, human-environment interaction breaks off (Gulturk and Sisman 2015), and the levels of perception and preference of environments decrease gradually. As environmental features affect human psychology, in other words, the perception of landscape and the admiration-preference that it creates in mind (Aytas and Uzun 2015), it is significant to determine the spatial features to be added to the environment. For this reason, firstly, literature on visual quality was examined and common landscape features which mostly in-

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crease the level of human-environment interaction were determined.

Environmental Components of Perceived Visual Quality

Visual quality is concerned with how people see and perceive the environment and as a result, with their assessment of the environment (Val et al. 2005). Many components have been revealed their research in terms of increasing the visual preference in a visual quality assessment (Tempesta 2010). The most frequently studied components in this field are mystery, complexity, legibility and coherence proposed by Kaplan and Kaplan (1989) in Information Processing Theory model. The other studied components are novelty, order, complexity, naturalness focused on by Berlyne's (1974) and historicity proposed by in Tuan's (1974) in Topophilia theory. Visual quality and preference studies conducted in urban and rural areas have been developed mostly based on these concepts.

Generally researches which evaluated the visual quality of natural scenery of rural areas or urban areas were considered. The concepts describing the effect of the visual quality value of rural areas on people's preferences (complexity, novelty, coherence, legibility, imageability, naturalness, historicity, and mystery) have been identified by many researchers (Tveit et al. 2006; Ode et al. 2008; Fry et al. 2009; Ozhanci and Yilmaz 2011; Kalin et al. 2014; Benliay et al. 2015; Svobodova et al. 2015). On the contrary, the concepts describing the effect of the visual quality value of the urban environment where we spend most of our time (legibility, orientation, harmony, complexity, historicity, physical properties such as size, color and shape) have been clarified by a few researchers (van Mansvelt and Kuiper 1999; Heath et al. 2000; Bostanci et al. 2006; Dovey and Polakit 2006; Kalin and Yilmaz 2012; Cubukcu et al. 2014; Aslan and Atik 2015; Aytas and Uzun 2015). Many studies tried to reveal the effect of the built environment on people by evaluating only one or maximum two concepts without connecting the concepts with one another (Heath et al. 2000; Imamoglu 2000; Bostanci et al. 2006; Kalin and Yilmaz 2012; Cubukcu et al. 2014). Describing the visual quality of a city with more concepts in these kinds of studies will probably be more useful in determining the perception and preference of people. Another disregarded issue

in previous studies is making evaluations by using only the present city views. Therefore, how the changes in a city within a timeframe affects peoples cannot be detected. However, urban environments include past elements as well as new elements in the city. Moreover, it is necessary to reinterpret old elements (Aslan and Atik 2015) and balance between the old and new to make the visual quality level of an environment higher.

Aim the Paper

Accordingly, this research aimed to identify how the visual quality of the urban environment, the physical structure of which changes in time, changes from the past to present and how this change affects people. Therefore, the concepts of complexity, historicity, and consistency used separately in previous studies for identifying the visual quality of urban environment were evaluated together to determine the visual quality of old and new views in this paper. The research questions are; Would the change in complexity, historicity and coherence levels in a city's scene with time change the city's visual quality? Would these features being at a stronger or a weaker level in a city's scene affect the visual quality evaluations and preferences of people?

Within the context of these purposes, the concepts of complexity, historicity and coherence were addressed in detail, visual features as indicators of these concepts were determined, and their relationship to visual quality and preference were considered (Table 1). A theoretical framework of the research was constituted as in Figure 1. Thus, common features which affect the environment preferences of people positively or negatively and how these are related were shown in a scheme based upon a scientific foundation.

MATERIAL AND METHODS

Study Areas

The research was conducted in the coastal section of the province of Trabzon, located in the Eastern Black Sea region, Turkey. Trabzon coast is in the city center and on the city's main road route. Therefore, it is an area frequently used in daily life. This area is very large and comprehensive so Çömlekçi, Ganita, Kemer kaya, Kanuni Anatolian High School and Moloz regions,

Table 1: The basic visual quality concepts of the research, their indicators and relationship to visual quality and preference

ENVIRONMENTAL PREFERENCE		
Concepts	Components	
<i>Complexity:</i>	Existence of various components within the environment and individual's perception of this variety (Nasar 1988b; Tveit et al. 2006) Co-existence of different visual elements in terms of form, shape, dimension in the same environment Many studies have identified an inverse U-shape relationship between complexity and preference which shows the optimal value for preference; complexity values above or below this value are preferred to a lesser extent (Berlyne 1974; Crozier 1974; Kaplan 1987; Imamoglu 2000; Bostanci et al. 2006; Cubukcu et al. 2014).	Variety Diversity
<i>Historicity:</i>	The degree of historical continuity and richness in the landscape. Historical richness focuses on diversity and quantity of cultural elements, while historical continuity is reflected by visual presence of elements in different timeframes (Ode et al. 2008). Historical continuity brings sense of time and meaning to the landscape, enhancing aesthetics of the landscape (Tveit et al. 2006). Historicity examined as the organization of vegetation and landscape features (size of the area, shape of the area, spatial arrangement of the plants) (Ode et al. 2008), or as the existence or absence of cultural components, focusing on historical characteristics in landscape (van Mansvelt and Kuiper 1999). The meaning which occurs as a result of the unity of elements in the scene. The more harmonious this unity is the easier is its comprehension and perception. The existence of elements which form a good gestalt, are recurring, and show similarities Such urban scenes would possess a higher level of preferability (Wohlwill 1968). Previous studies related this concept with attributes such as unity, harmony, integrity, order, balanced distribution and repetition (Berlyne 1974; Kaplan 1977; Horayangkura 1978; Oosyendorp and Berlyne 1978; Herzog 1989; Dovey and Polakit 2006; Akyol 2011; Cubukcu et al. 2014)	The Presence of Historical Element ence Compatible Unity Similarity Order
<i>Coherence:</i>		the city's visual quality the prefer- users

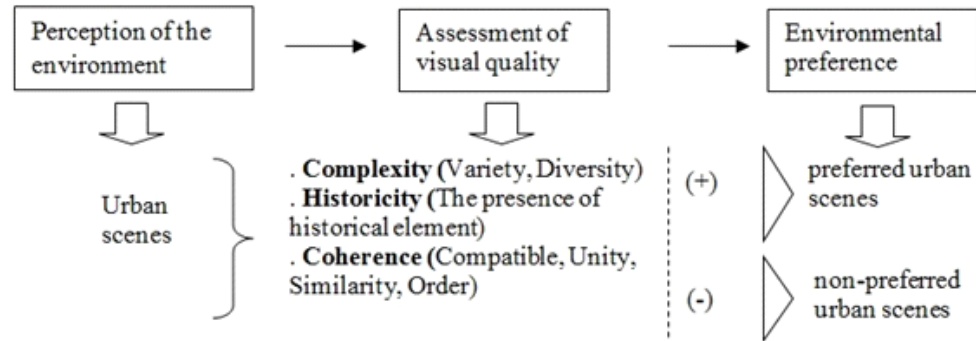


Fig. 1. Framework of research

which constitute the locations with the most special features of the coast in the past and today were specified as places where the application would be evaluated (Fig. 2). This specification was supported by the areas that came to the fore as a result of respondents' evaluations in an application study by Kalin (2004).

Questionnaire Design

To ensure reliability in the visual quality evaluations, the research must be conducted with large groups of subjects. However, since the study areas were distributed in the whole city and it was difficult to take all subjects to these areas at the same time a visual questionnaire was used to evaluate different scenes. It was emphasized by the researchers that it would be more appropriate to present photographs of the area to the respondents in such cases (Nasar 1988a; Clay and Smidt 2004; Kalin et al. 2014; Sakici 2015). As a result of these studies, photograph-based perceptual judgments and preferences can be said to be consistent with the responses given to the landscape represented. Because of all these assumptions, it was found appropriate to ask people to make their preference assessments using photographs of urban scenes.

For assessment of urban scenes, photographs showing former states of 5 districts on Trabzon coastline (Çömlekçi, Ganita-Kemerkeya, Kanuni Anatolian High School, Moloz1 and Moloz2) were obtained (Bolukbasi 2006). In order to get reliable descriptions of the difference between two scenes, new photographs of urban scene were taken at the same location using the same camera angle as the old photographs in the

summer of 2011 between 2pm and 5pm (Fig. 3). It was thought that photographs with different properties would have an impact on the respondents and decrease the reliability of the paper so it was found appropriate to convert color images of urban scenes of today into black and white as was the case for old photographs. Images of old scenes have high values of complexity, coherence and historicity so it is clear that their visual quality is also high, whereas images of new scenes have such values to a lesser extent because of adverse urban changes and inability to preserve their visual quality. These scenes with distinct levels of complexity, historicity and coherence were used to reveal the relationship between preference and these concepts.

Application of the Questionnaire

A questionnaire is a frequently preferred method in determining the people's desires and perception used by various researchers (Sherman et al. 2005; Ozkan et al. 2015; Sakici 2015). The questionnaire was designed to evaluate people's perception and preference through old and new urban scenes. This paper is comprised of two stages.

Stage 1: An expert group of 20 people aged between 24 and 65, whose occupations are architecture, landscape architecture, and urban and regional planning, assessed old and new scenes of Trabzon using 7-point semantic differential scales (-3: extremely low, -2: very low, -1: low; 0: neutral, 1: high, 2: very high, 3: extremely high). This assessment contains the concepts of "complex-not complex", coherent-not coherent and historic-not historic", which were selected from

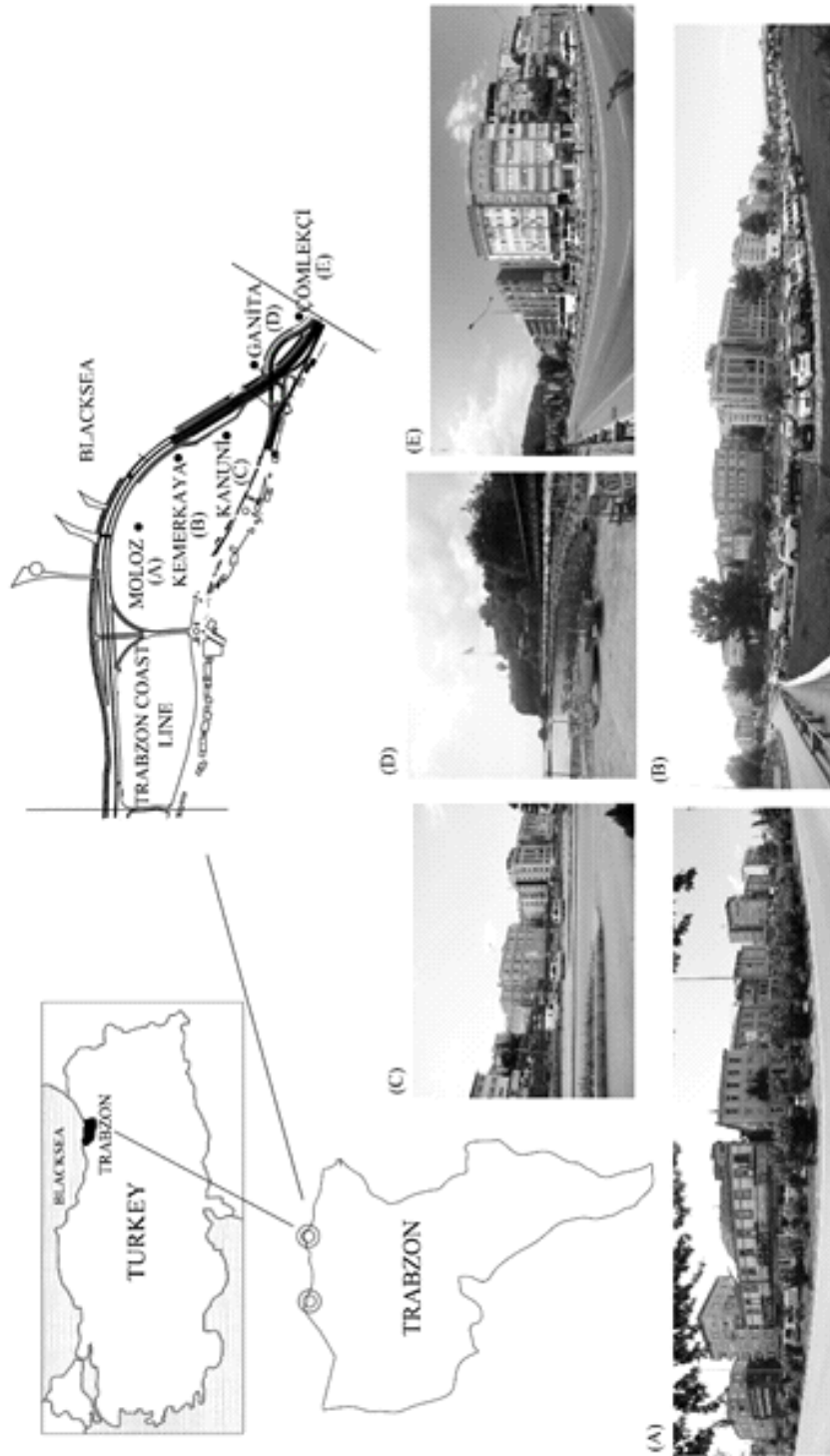
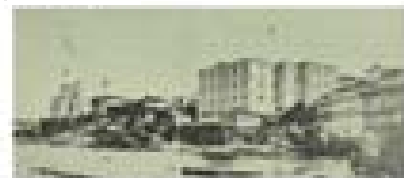


Fig. 2. Study area
Source: Author



Comlekci



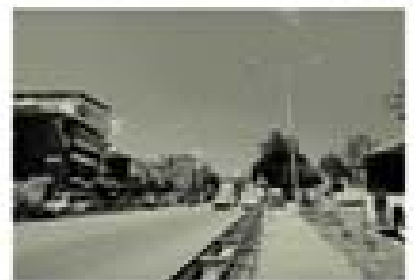
Ganita-Kemer kaya



Kanuni Anadolu High school



Moloz 1

Moloz 2
(a)

(b)

Fig. 3. (a) Old urban scenes (Bolukbasi 2006), (b) New urban scenes

previous studies on environmental preference (Crozier 1974; Horayangkura 1978; Kaplan 1987; Herzog 1989; Strumse 1994; Hägerhäll 1999; Tveit et al. 2006; Ode et al. 2008; Aytas and Uzun 2015; Benliay et al. 2015). The objective of this stage was to ensure that old urban scenes and new urban scenes were defined by the expert group, and to determine which of these concepts are present in which urban scene and to what extent. Hence, reliability of the paper was increased by comparing the non-expert group's assessments with the expert group's assessments.

Stage 2: The stage consists of 3 parts each of which have been prepared for different purposes:

Part A: To determine the impact on the preference of the socio-demographic characteristics (particular age, profession) of the subject.

Part B: To determine the visual quality of old and new scene in terms of 'Complexity', 'Historicity' and 'Coherence'.

Part C: To determine which old or new scenes were preferred and not preferred by the subjects

In Part A, evaluations were carried out with 107 people (51 females – 56 males) who live in the city of Trabzon or have been in Trabzon for at least 5 years. In addition, age criterion was also considered while selecting respondents, hence people who are familiar with the former state of the respective area and young people who are familiar with the current state of the respective area were selected in order to determine whether there is any difference between the assessments of people who are familiar with the former state of the city and of those who were not. This ensured that more reliable results were obtained from the questionnaire. The relation-

ship between the respondents' educational background, occupation, age and preference was also investigated. In Part B, concepts of visual quality (complexity, coherence and historicity) by which the expert group evaluates the photographs were converted into corresponding statements comprehensible to the respondents, and the respondents were asked to rate them (complexity; diversity - variety, historicity; presence of historical element, coherence; compatible-unity-similarity- order) (Table 2). Then a 5-point Likert attitude scale (1: strongly agree; 2: agree; 3: neutral, 4: disagree, 5: strongly disagree) were used for respondents to assess a total of 10 photographs of Trabzon, including 5 old and 5 new photographs, and their responses were evaluated by 5 ratings, including '1-2 range: very high 2-3range: high 3-3.5 range: medium 3.5-4range: low 4-4.5 range: very low'. Data obtained from this part was designated as the rating data. In part C, the subject were shown the photographs of old and new scenes from the Trabzon coastline, which were taken at the same location using the same camera angle, and were asked their favorite scene among the old and new scenes, their most favorite scene among all the old scenes and all the new scenes. Data obtained from this part was designated as the preference data.

RESULTS

The Expert Group's Ratings of Old and New Scenes

In order to determine how the experts rate the scenes, frequency distribution values and percentages of answers given to old and new

Table 2: Statements in the questionnaire

<i>Concepts</i>	<i>Components</i>	<i>Statements corresponding to the Components</i>
<i>Coherence</i>	Compatible	• Man-made environment and natural environment seen in this photograph are compatible with each other.
	Unity	• Man-made environment and natural environment seen in this photograph are integrated with each other.
	Similarity	• Elements seen in these photographs have similar and/or repetitive features.
	Order	• Composition of elements comprising the scenery in this photograph is in order.
<i>Historicity</i>	The presence of historical element	• This photograph contains historic-cultural elements associated with/reflecting Trabzon.
<i>Complexity</i>	Variety	• This photograph has elements giving mobility effect by disrupting the monotony (changes in horizontal-vertical planes).
	Diversity	• This photograph has different/various elements.

photographs of this district were determined. The experts' ratings of the old scenes of the city were at a higher level of historicity and coherence (80% and above) compared to the new scenes, while their ratings of the new scenes were mostly at a high level of complexity, and of the old scenes at a medium level complexity (60-80%) (Table 3).

Two-Related Sample t-test was utilized to establish whether there is any significant difference between complexity, historicity and coherence levels of old and new scenes. In order to increase reliability in the results, sig. (significance) values were considered as 0.01. Mean complexity, historicity and coherence ratings of

Table 3: Visual quality assessment of the expert group

Concepts Locations of City	Complexity				Historicity				Coherence			
	Old		New		Old		New		Old		New	
	F	P	F	P	F	P	F	P	F	P	F	P
<i>Çömlekçi</i>												
-3	1	5%	-	-	-	-	11	55%	-	-	1	5%
-2	1	5%	-	-	-	-	7	35%	-	-	9	45%
-1	3	15%	-	-	-	-	-	-	-	-	8	40%
0	11	55%	-	-	-	-	1	5%	-	-	1	5%
1	-	-	-	-	3	15%	1	5%	4	20%	1	5%
2	4	20%	15	75%	9	45%	-	-	10	50%	-	-
3	-	-	5	25%	8	40%	-	-	6	30%	-	-
Total	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%
<i>Ganita-Kemer kaya</i>												
-3	1	5%	-	-	-	-	10	50%	-	-	2	10%
-2	-	-	-	-	-	-	10	50%	-	-	4	20%
-1	2	10%	-	-	-	-	-	-	-	-	9	45%
0	1	5%	-	-	-	-	-	-	-	-	2	10%
1	3	15%	-	-	-	-	-	-	1	5%	2	10%
2	13	65%	4	20%	2	10%	-	-	9	45%	1	5%
3	-	-	16	80%	18	90%	-	-	10	50%	-	-
Total	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%
<i>Kanuni A.H.</i>												
-3	2	10%	-	-	-	-	-	-	-	-	1	5%
-2	-	-	-	-	-	-	-	-	-	-	-	-
-1	1	5%	-	-	-	-	-	-	-	-	3	15%
0	-	-	2	10%	-	-	1	5%	-	-	2	10%
1	6	30%	4	20%	1	5%	8	40%	-	-	12	60%
2	10	50%	10	50%	1	5%	10	50%	19	95%	2	10%
3	1	5%	4	20%	18	90%	1	5%	1	5%	-	-
Total	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%
<i>Moloz 1</i>												
-3	1	5%	-	-	-	-	17	85%	-	-	17	25%
-2	1	5%	-	-	-	-	2	10%	-	-	2	55%
-1	1	5%	-	-	-	-	-	-	-	-	1	20%
0	2	10%	-	-	-	-	-	-	-	-	-	-
1	10	50%	-	-	5	25%	1	5%	-	-	-	-
2	4	20%	3	15%	14	70%	-	-	4	20%	-	-
3	1	5%	17	85%	1	5%	-	-	16	80%	-	-
Total	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%
<i>Moloz 2</i>												
-3	1	5%	-	-	-	-	14	70%	-	-	1	5%
-2	-	-	-	-	-	-	5	25%	-	-	14	70%
-1	3	15%	-	-	-	-	-	-	-	-	4	20%
0	-	-	-	-	-	-	-	-	-	-	1	5%
1	9	45%	-	-	2	10%	1	5%	2	10%	-	-
2	6	30%	11	55%	7	35%	-	-	13	65%	-	-
3	1	5%	9	45%	11	55%	-	-	5	25%	-	-
Total	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%	n: 20	100%

The definition level (-3: extremely low, -2: very low, -1: low; 0: neutral, 1: high, 2: very high, 3: extremely high). n: the number of expert assessing old and new scenes. F. Frequency P: Percent

old and new scenes of the districts; Çömlekçi, Ganita-Kemerkaya, Kanuni Anatolian High School, Moloz1, Moloz2 are shown in Table 4. Hence, it was also supported by the expert group's ratings that old and new urban scenes have different levels of complexity, historicity and coherence values, as was assumed in the beginning.

Factor Analysis of the Rating Data

A classification was made by converting the concepts (complexity, historicity, coherence) used for the expert group to rate the photographs, into corresponding statements comprehensible to the respondents as diversity – variety (complexity), presence of historical element (historicity) and compatibility-unity-similarity- order (coherence). In order to check the accuracy of this classification, a factor analysis was performed on all 7 items aimed towards the respondents, using a likert attitude scale. According to 'eigenvalue greater than one' criterion, three factors emerged which accounted for 71.1 per cent of the variance.

The first factor, classified as Coherence Factor, had an eigenvalue of 2.44 and accounted for

34.9 percent of the total variance. The first factor had features of compatibility-unity-similarity-order with heavy loading. Complexity Factor was classified as the second factor. This factor had diversity-variety features with heavy loading. It had an eigenvalue of 1.52 and accounted for 21.7 percent of the total variance. As mentioned above, the third factor was classified as the Historicity Factor. It had an eigenvalue of 1.01 and accounted for 14.4 percent of the total variance. And it only contains the feature of presence-absence of historic richness (Table 5).

Analysis of the Rating Data

In order to determine how the users perceive old and new scenes, frequency distribution values and percentages of the responses to old and new photographs of the respective district were estimated. The users rated the old scenes of the city at a higher level of historicity and coherence (80% and above) compared to the new scenes, while most of the new scenes were rated at a high level of complexity, and the old scenes at a medium level of complexity (60-80%). The respondents' ratings of old and new scenes of Tra-

Table 4: The expert group's ratings visual quality for urban scenes

Scenes	Complexity			Historicity			Coherence		
	Old	New	Sig.	Old	New	Sig.	Old	New	Sig.
Çömlekçi	4.55	6.25	p<0.01*	6.25	1.7	p<0.01*	6.1	2.65	p<0.01*
Ganita-Kemerkaya	5.2	6.80	p<0.01*	6.9	1.5	p<0.01*	6.45	3.05	p<0.01*
Kanuni A. H.	5.10	5.80	p<0.01*	6.85	4.55	p<0.01*	6.05	4.5	p<0.01*
Moloz1	4.75	6.85	p<0.01*	5.8	1.3	p<0.01*	5.8	1.95	p<0.01*
Moloz2	4.9	6.45	p<0.01*	6.45	1.45	p<0.01*	6.15	2.25	p<0.01*

*p<0.01 level is showing that is significant difference between complexity, historicity and coherence levels of old and new scene. The definition level [1-2.5 range: very low; 2.5-3.5 range: low; 3.5-5 range: medium; 5-6 range: high; 6-7 range: very high].

Table 5: Factor analysis of the components of the visual quality

	Factor loadings			Communality
	1	2	3	
Factor 1- Coherence <i>Abbreviation</i>				
Compatible (CPL)	0.80	-0.09	0.08	0.65
Unity (UNY)	0.83	-0.18	-0.08	0.74
Similarity (SMY)	0.68	-0.10	0.26	0.55
Order (ORR)	0.70	0.12	0.16	0.53
Factor 2- Complexity				
Diversity (DRY)	-0.138	0.85	-0.06	0.77
Variety (VRY)	0.00	0.88	-0.13	0.78
Factor 3 –Historicity				
The presence of historical element (HRY)	0.35	0.08	0.96	0.93
% of variance	34.95	21.72	14.48	71.16

bzon are presented in Table 6. The purpose of this part is to support the non-expert group's ratings revealed by the second part with the expert group's ratings. Hence, it was established that the respondents perceived coherence, complexity and historicity levels of old and new scenes specified by the expert group, and rated them in accordance with the experts' determinations. Despite some minor differences, there was a significant relationship between the expert group's and the non-expert group's perceptions and ratings, and the basic effect of complexity, historicity and coherence was applicable to both groups.

Two-Related Sample t-test was employed to establish whether there is any significant difference between diversity-variety (complexity), presence of historic richness (historicity), compatibility-unity-similarity- order (coherence) levels of old and new scenes. In order to increase the reliability of the results, significance value was considered as 0.01. The rating difference determined for each variable between old and new scenes of Çömlekçi, Ganita-Kemer kaya, Kanuni Anatolian High School, Moloz1, Moloz2 districts was $p < 0.01$. Hence, old and new urban scenes containing various levels of complexity, histo-

ricity and coherence can be said to be perceived and rated accordingly by the respondents (Table 7).

Analysis of the Preference Data

The basic assumption of the paper was that coherence, historicity and complexity, which are some of the visual quality concepts, are influential preference of an environment, and that places with high levels of such concepts would be preferred to places with low levels of such concepts. The rating data was used to determine evaluations and descriptions of the coastal scenes. In order to test whether the respondents preferred the old scenes for which they rated these concepts at a high level, or new scenes, for which they rated these concepts at a lower level, the respondents were asked whether they liked the old or the new scenes of Trabzon shown to them, and in which one of them they would like to live. All old scenes were preferred more than new scenes.

χ^2 -test was conducted to determine whether the preference differences were statistically significant or not (For Çömlekçi, $\chi^2 = 49.804$; 1 df, $p < 0.01$; for Ganita, Kemer kaya, $\chi^2 = 41.943$; 1 df, $p < 0.01$; for Kanuni Anatolian High School, $\chi^2 =$

Table 7: The non-expert group's ratings visual quality for urban scenes

Abbreviation	Coherence					Historicity		Complexity		
	CPL	UNY	SMY	ORR	M	HRY	M	DRY	VRY	M
<i>Çömlekçi</i>										
Old	1.82	1.95	1.92	2.07	1.94	1.93	1.93	3.71	4	3.85
New	4.03	3.83	3.43	3.69	3.74	3.69	3.69	2.4	2.21	2.3
Sig.					$p < 0.01^*$		$p < 0.01^*$			$p < 0.01^*$
<i>Ganita-Kemer kaya</i>										
Old	2.07	1.97	2.15	2.20	2.09	1.83	1.83	3.24	3.93	3.58
New	3.27	3.31	2.97	3.32	3.21	3.83	3.83	2.04	1.93	1.98
Sig.					$p < 0.01^*$		$p < 0.01^*$			$p < 0.01^*$
<i>Kanuni A.H.</i>										
Old	1.79	1.78	2.06	1.93	1.89	1.55	1.55	3.28	3.46	3.37
New	3.01	2.96	2.93	3.08	2.99	3.18	3.18	2.43	2.73	2.58
Sig.					$p < 0.01^*$		$p < 0.01^*$			$p < 0.01^*$
<i>Moloz 1</i>										
Old	2	1.94	2.07	1.99	2	1.89	1.89	3.75	3.98	3.86
New	3.91	3.97	3.66	3.92	3.86	3.91	3.91	2.21	2.07	2.14
Sig.					$p < 0.01^*$		$p < 0.01^*$			$p < 0.01^*$
<i>Moloz 2</i>										
Old	1.99	2.04	1.85	2.05	1.98	1.78	1.78	3.70	4.07	3.88
New	4.05	4.07	3.26	3.87	3.81	3.97	3.97	2.28	2.30	2.29
Sig.					$p < 0.01^*$		$p < 0.01^*$			$p < 0.01^*$

* $p < 0.01$ level is showing that is significant difference between complexity, historicity and coherence levels of old and new scene. The definition level [1-2 range: very high 2-3 range: high 3-3.5 range: medium 3.5-4 range: low 4-4.5 range: very low]. M: Mean.

Table 6: Visual quality assessment of the non-expert group

Abbreviation	Coherence						Historicity						Complexity					
	CPL			UNY			SMY			ORR			HRY			DRY		
	Old	P	F	Old	P	F	Old	P	F	Old	P	F	Old	P	F	Old	P	F
	%		%	%		%	%		%	%		%	%		%	%		%
<i>Çömlekçi</i>																		
1	32	29.9	1	0.9	25	23.4	6	5.6	25	23.4	7	6.5	27	25.2	6	5.6	34	31.8
2	69	64.5	9	8.4	71	66.4	9	8.4	72	67.3	21	19.6	62	57.9	20	18.7	57	53.3
3	1	0.9	3	2.8	3	2.8	7	6.5	5	4.7	15	14	3	2.8	4	3.7	7	6.5
4	3	2.8	67	62.6	7	6.5	60	56.1	4	3.7	47	43.9	14	13.1	48	44.9	7	6.5
5	2	1.9	27	25.2	1	0.9	25	23.4	1	0.9	17	15.9	1	0.9	29	27.1	2	1.9
n= 107	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100
Total																		
<i>Ganita-Kemerkaya</i>																		
1	27	25.2	4	3.7	29	27.1	3	2.8	12	11.2	4	3.7	21	19.6	4	3.7	39	36.4
2	63	58.9	36	33.6	62	57.9	34	31.8	78	72.9	48	44.9	64	59.8	32	29.9	56	52.3
3	3	2.8	9	8.4	8	7.5	13	12.1	9	8.4	11	10.3	7	6.5	11	10.3	4	3.7
4	11	10.3	43	40.2	6	5.6	41	38.3	5	4.7	35	32.7	10	9.3	46	43	7	6.5
5	3	2.8	15	14	2	1.9	16	15	3	2.8	9	8.4	5	4.7	14	13.1	1	0.9
n= 107	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100
Total																		
<i>Kanuni A.H.</i>																		
1	35	37.2	6	5.6	35	32.7	7	6.5	23	21.5	7	6.5	28	26.2	7	6.5	57	53.3
2	65	60.7	45	42.1	65	60.7	44	41.1	64	59.8	44	41.1	66	61.7	38	35.5	43	40.2
3	2	1.9	11	10.3	3	2.8	11	10.3	11	10.3	15	14	6	5.6	11	10.3	5	4.7
4	4	3.7	32	29.9	4	3.7	36	33.6	9	8.4	31	29	6	5.6	41	38.3	2	1.9
5	1	0.9	13	12.1	-	-	9	8.4	-	-	10	9.3	1	0.9	10	9.3	-	-
n= 107	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100
Total																		
<i>Moloz1</i>																		
1	21	19.6	1	0.9	21	19.6	1	0.9	17	15.9	2	1.9	24	22.4	2	1.9	38	35.5
2	73	68.2	9	8.4	77	72	8	7.5	74	69.2	17	15.9	68	63.6	13	12.1	52	48.6
3	6	5.6	9	8.4	4	3.7	7	6.5	8	7.5	10	9.3	7	6.5	10	9.3	8	7.5
4	6	5.6	68	63.6	4	3.7	68	63.6	7	6.5	64	59.8	8	7.5	49	45.8	9	8.4
5	1	0.9	20	18.7	1	0.9	23	21.5	1	0.9	14	13.1	-	-	33	30.8	-	-
n= 107	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100
Total																		
<i>Moloz2</i>																		
1	24	22.4	3	2.8	23	21.5	1	0.9	28	26.2	1	0.9	31	29	3	2.8	42	39.3
2	70	65.4	10	9.3	69	64.5	9	8.4	72	67.3	39	36.4	54	50	12	11.2	54	50.5
3	5	4.7	4	3.7	6	5.6	7	6.5	3	2.8	10	9.3	10	9.3	13	12.1	5	4.7
4	6	5.6	52	48.6	6	5.6	54	50.5	3	2.8	45	42.1	10	9.3	47	43.9	5	4.7
5	2	1.9	38	35.5	3	2.8	36	33.6	1	0.9	12	11.2	2	1.9	32	29.9	1	0.9
n= 107	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100	n	100
Total																		

F: Frequency value, P: Percent value .The definition value (1: strongly agree, 2: agree, 3: neutral, 4: disagree, 5: strongly disagree). n: the number of non-expert assessing old and New.

67.523; 1 df, $p < 0.01$; for Moloz1, $\chi^2 = 91.598$; 1 df, $p < 0.01$; for Moloz2, $\chi^2 = 67.523$; 1 df, $p < 0.01$). These results demonstrated that preference distributions of old and new scenes are statistically significant. The old scenes, which are coherent and historic at a high level, were preferred more than the new scenes with lower level of coherence and historicity, whereas the old scenes with medium level of complexity were preferred more than the new scenes with high level of complexity (Table 8).

The respondents were also asked to rate old and new scenes among themselves to determine which of the old scenes they preferred more. Thus, the relationship between preference and the concepts was established in a stronger way, rather than in a single way. The scenes preferred among the old scenes were as follows in decreasing order: Kanuni Anatolia High School: 34.6,

Moloz 2: 25.2, Çömlekçi: 18.7, Moloz 1: 13.1, Ganita: 8.4. The scene of Moloz1, which was rated at the highest level of historicity-coherence (1.55, 1.89 respectively) and medium level of complexity (3.37), was the old scene which was preferred the most. The scenes preferred among the new scenes were as follows in decreasing order: Kanuni Anatolian High School: 45.8, Çömlekçi: 26.2, Moloz2: 14, Moloz1: 8.4, Ganita-Kemerkaya: 5.6. In the case of new scenes, the scene of Kanuni Anatolian High School, which was rated at the highest level of historicity and coherence (3.18, 2.99, respectively) and a lower level of complexity (2.58) compared to the other scenes, was preferred the most. (Table 9) χ^2 -test was conducted to determine whether the preference differences were statistically significant or not. The preference differences for both old and new scenes were proved to be statistically significant (pref-

Table 8: The impact on preference of the components of the visual quality

	Scene	Complexity	Historicity	Coherence	Preference %
Çömlekçi Total	Old	3.85	1.93	1.94	84.1
	New	2.3	3.69	3.74	15.9100
Ganita – Kemerkaya Total	Old	3.58	1.83	2.09	81.3
	New	1.98	3.83	3.21	18.7100
Kanuni Anadolu Lisesi Total	Old	3.37	1.55	1.89	89.7
	New	2.58	3.18	2.99	10.3100
Moloz1 Total	Old	3.86	1.89	2	96.3
	New	2.14	3.91	3.86	3.7100
Moloz2 Total	Old	3.88	1.78	1.98	89.7
	New	2.29	3.97	3.81	10.3100

The definition level [1-2 range: very high 2-3range: high 3-3.5 range: medium 3.5-4range: low 4-4.5 range: very low]. The highest preferences were shown in bold.

Table 9: Old and new scenes which were preferred the most and the least

<i>Old Scenes</i>				
<i>Locations of city</i>	<i>Complexity</i>	<i>Historicity</i>	<i>Coherence</i>	<i>Preference No. (%)</i>
Kanuni A. H.	3.37	1.55	1.89	37 (34.6)
Moloz2	3.88	1.78	1.98	27 (25.2)
Çömlekçi	3.85	1.93	1.94	20 (18.7)
Moloz 1	3.86	1.89	2	14 (13.1)
Ganita-Kemerkaya	3.58	1.83	2.09	9 (8.4)
<i>New Scenes</i>				
<i>Locations of city</i>	<i>Complexity</i>	<i>Historicity</i>	<i>Coherence</i>	<i>Preference No. (%)</i>
Kanuni A. H.	2.58	3.18	2.99	49 (45.8)
Çömlekçi	2.3	3.69	3.74	28 (26.2)
Moloz2	2.29	3.97	3.81	15 (14)
Moloz1	2.14	3.91	3.86	9 (8.4)
Ganita-Kemerkaya	1.98	3.83	3.21	6 (5.6)

The definition level [1-2 range: very high 2-3range: high 3-3.5 range: medium 3.5-4range: low 4-4.5 range: very low]. The highest values preferences were shown in bold.

erence for old scenes, $\chi^2 = 22.673$; 4 df, $p < 0.00$, preference for new scenes $\chi^2 = 56.131$; 4 df, $p < 0.00$)

Comparison of the Extent of Preference for Coastal Scenes by the Respondents' Ages

Crosstab analysis was used to determine the rate of difference in preference of people who are familiar with the old scene (old) and people who are unfamiliar with the old scene (young people) for old and new scenes. While analyzing these values, the preference rates of the districts were addressed with age ranges of the respondents. Hence, the difference between the preferences for old and new coastal scenes with distinct levels of visual quality concepts (findings from the first and second parts) by ages of the users were examined (Table 10).

χ^2 -test showed that the distributions shown in Table 10 are not statistically significant, revealing that the age factor is not influential in preferences for old or new scenes. In other words, the respondents' ratings of the scenes did not exhibit any age-related differences. In addition, crosstab analysis was employed to determine whether the respondents' preferences were affected by their educational background or by being a native of Trabzon and the analysis showed that these factors were not statistically significant, in other words, they did not affect their preferences. Thus, the effects of complexity, historicity and coherence on preference were established more solidly.

DISCUSSION

In this paper, the complexity, historicity and coherence levels in the old and new urban

scenes of Trabzon were used to determine how the visual quality of the city has changed. As a result of this analysis, the relationship between the determined visual quality levels and the preference of users was established. In visual quality studies that have been carried out since 1970 (Berlyne 1974; Wohlwill 1976; Strumse 1994; Nasar 1988b; Hägerhäll 1999; Imamoglu 2000; Gehl et al. 2006; Akyol 2011; Cubukcu et al. 2014; Kalin et al. 2014; Aytas and Uzun 2015; Benliay et al. 2015) it was asserted that complexity, historicity and coherence have an impact on spatial perception and preference.

Aytas and Uzun (2015) found out in their studies specifying the visual landscape quality of pedestrian areas that naturalness (coherence, seasonability, size) is the most effective factor in perception and preference. This is followed by the factors of manageability (complexity, scene, discomfort) and historicity. In addition, Aminzadeh and Ghorashi (2007) suggested in a similar study that semi-natural landscapes were preferred compared to natural and designed landscapes and expressed it with the factor of naturalness. On the other hand, the factor of historicity was found in this paper to be the most effective factor in preference, and it is followed by the consistency factor. Therefore, this result does not comply with the results mentioned above. The reason for this is that natural areas and urban areas were not evaluated together in this paper; instead, only the visual quality value of changing urban environment and its effect on people were identified. Moreover, Zube (1974) emphasized that studies need to be carried out by discriminating natural and urban environments in order to reach more credible and correct results (Bourassa 1990).

Table 10: Distribution of the respondents' preferences for old and new scenes by age

		Age		Total
Scenes		Young N=44	Old N=63	N=107
Çömlekçi	Old (%)	79.5	87.3	84.1
	New (%)	20.5	12.7	15.9
Ganita - Kemer kaya	Old (%)	79.5	87.3	89.7
	New (%)	20.5	12.7	10.3
Kanuni Anadolu Lisesi	Old (%)	86.3	92	89.7
	New (%)	13.7	8	10.3
Moloz1	Old (%)	97.7	95.2	96.3
	New (%)	2.3	4.8	3.7
Moloz2	Old (%)	90.9	88.8	89.7
	New (%)	9.1	11.2	10.3

n: the number of person assessing old and new scenes.

Accordingly, a linear relationship was found between coherence and preference in the studies by Nasar (1988b) on the evaluation of 'street scenes', by Gehl et al. (2006) on 'Close Encounters with Buildings' and by Cubukcu et al. (2014) on 'the effect of commercial street board arrangements on aesthetic evaluations'. Besides, Gulturk and Sisman (2015) stated that physically-matching, well-maintained and organized sites were the factors playing the most important role in preference. The result obtained complies with the results of this paper. It was ascertained in this study that old scenes including physically-matching, organized and similar elements were appreciated by people. The old scenes with a high level of coherence were liked and preferred more than the new scenes with a low level of coherence.

An inverse-U relationship was found between complexity and preference in the studies by Cubukcu et al. (2014) on 'the effect of commercial street board arrangements on aesthetic evaluations', by Imamoglu (2000) and Belinay et al. (2015) on the relationship between 'complexity and preference'. This paper concludes that the scenes characterized by moderate complexity are more appreciated and preferred than the scenes characterized by a maximum or minimum level of complexity. The old scenes with a medium level of complexity were more liked and preferred to the new scenes with a maximum level of complexity to this paper. The concept of historicity was dealt with by Tuan (1974) as an important component in the evaluation of a scene. The fact that historicity plays an important role in landscape perception and preference was established later on in the studies of Strumse (1994), Hägerhäll (1999), Tveit et al. (2006), Ode et al. (2008) and Aytas and Uzun (2015). Moreover, the studies conducted emphasized the importance of the existence of water and green areas as the features increasing the quality of a city (Yilmaz et al. 2015). From the results of this paper, it was concluded that historical texture and water-city relation of old scenes were disregarded with new housing in new scenes; and this had a negative effect on the preference of people. The findings obtained in this research by conducting an experimental study are of a supporting nature to these studies.

CONCLUSION

One of the most important aspects of this paper dealing with the preference of an environ-

ment is its association of preference with common landscape features (complexity, coherence and historicity) in the framework of the integrative approach. Studies conducted on visual quality and preference generally carried out their research by focusing on rural areas or taking into consideration of only the physical components of the environment or personal evaluations of users. Limited numbers of studies were encountered on the visual quality of urban environments. The original aspect of this paper lies in focusing on old and new urban scenes and the use of the above-mentioned approaches together. The data from the questionnaire was used to determine the levels of complexity, coherence and historicity of the old and new scenes, and the relationship of this data with preference was revealed. This paper is not only based on one set of data but on several sets of data. Similar results were obtained for the respondents who were familiar with the old scenes as well as young people, for the experts as well as non-experts, for those native of Trabzon as well as those who are non-natives, for women as well as men, which further proved the validity of the results. These findings showed that the visual quality of Trabzon coastline is influential on people's preferences and that experience-, habit- and age-related factors do not affect preferences. It is expected that people who are familiar with, have memories of and miss the old scene prefer the old. However, young people who are unfamiliar with the old scene but familiar with the new scene and are not aware of the negative change in the scene also preferred the old, which showed that the environment is associated with the features contained in it. In summary, the results obtained from this paper established that if a medium level of complexity and a high level of coherence and historicity are provided in the scenery of a city, the visual quality of those city increases, which duly affect the preferences of user.

RECOMMENDATIONS

The existence of historicity, complexity and coherence all together in the scene of a city, has a significant effect on environmental perception and preference. The scenes including these concepts together attract people's attention more easily and create the feeling of appreciation and living there with love. Considering these factors in previous urban projects, the scenes that people preferred were created. Nevertheless, urban

designs performed nowadays are made without considering the effect of these concepts on people, and human-environment interaction comes to a breakaway point. Based on this problem, this paper focused on the effect of historicity, consistency and complexity of the urban scenes changing from the past to present on preference by evaluating the perception level. According to the results of this paper, old and new scenes with the values of complexity, historicity and consistency at different levels meet the needs of people at different levels. In order to create the environments that meet the needs of people, making an environmental design, designs compatible with or similar to pre-existing elements, which show a balanced distribution in the environment, can be constructed, and one can refrain from creating environments which are isolated from each other and hard to make sense of. It can be ensured that unsound settlements, non-planned urbanization disrupting the city's configuration and causing the city to lose its perceptibility are abandoned, and instead, structures bringing meaning to the environment, which cannot be forgotten easily are taken into consideration. While designing an environment, a balanced distribution between man-made products and natural elements can be achieved. So designs can be made by ensuring that artificial elements, including buildings, roads, bridges, and so on do not weaken or destroy the effects of natural elements, including sea, rocks, plants, and so on. All the elements of an environment may show diversity and be different; however, such difference should be neither so intense that it becomes complex nor so low that it causes monotony. Between the elements, there should be an order to an extent that will not disrupt harmony and a difference to an extent that will not disrupt complexity. The results of this paper will be useful for urban designers who want to make people happy with the city they live in.

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