Scrutinizing the Gestalt Principles in Natural Landscape Perception

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ABSTRACT
Landscape is the integration of characteristics of the geography within sight that include elements like climate, vegetation, animals, water stock, topography, and existence of human intervention, interactions of these elements, and outcomes of the interactions. In the natural landscape, the nature features the variety contained within itself without interference of mankind. Besides, soil, water, air, vegetation, and animal stock incorporate distinctive natural landscape complexes with varying colors, textures, dimensions and forms in places where the nature can preserve its natural order. Human beings constantly receive stimuli when they are in the nature. In this sense, each individual receiving sensory input from natural landscape complexes reacts with different perceptional responses.

In the current study, 20 special natural landscape complexes located within the provinces of Artvin and Rize, in the Eastern Black Sea Region of Turkey, were scored through photo assessment. Firstly, non-parametric correlation analysis was run, and correlations were spotted between factors like unity-balanced, unique-aesthetic, aesthetic-identity, unique-identity, continuity-unity, continuity-balanced, proximity-unity and proximity-continuity at a significant level. Then, implementing *varimax* rotation in factor analysis, directions of factors were revealed. In this way, 2 groups of factors were determined, the first one (self-identity) comprising sub factors of aesthetic, unique, dynamic, dominant, functional and figure-ground, and the latter (unity) embodying such sub-factors as similarity, balanced, continuity, proximity and plain. Finally, maximum and minimum values, as well as average values and standard deviations of the factors were determined through descriptive statistics performed. The results indicated a positive result as the average values of all the factors were around 4-5. The unity factor turned out to be more dominant compared to others with a value of 5.0430.

Keywords: Landscape, Natural Landscape, Natural Landscape Complexes, Perception, Gestalt Principles

INTRODUCTION
According to European Landscape Convention, "Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Anonymous, 2000). Such areas, be it urban, rural, highly valued, and famous for unmatched beauties or a plain land hosting ordinary life, are crucial elements for the quality of life for people living all around the world (Anonymous, 2012i). Forman and Godron (1986) defined landscape as "a heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout". Leser (1997), on the other hand, introduced the landscape as "a spatial texture that is made up of a functional combination of animate, inanimate and human-oriented components".

Landscapes embody the ecological processes, dynamism, variability, and interactions – including human interference at times - as a whole (Keçeli and Çelikoğlu, 2014). The variety that landscapes nest helps us understand how people see and perceive landscapes and the way they should evaluate them.

Physical environment has physical differences that can be listed as follows:

- Visual; form, measurement, height, color, texture, topography, landscape type etc. (visual perception!!!)
- Kinesthetic; elevation differences, curves,
- Audial; noisy, silent, man-made sounds, natural sounds etc.,
- Smell; man-made odors, odors caused by animals etc.,
- Air flows; winds, fog, clouds, light, shadow etc.,
- Temperature,
- Tactile; especially the texture that people step on (Gürer, 1990).

Perception refers to organization of environmental stimuli and information, and it is the process of transforming what is received from the environment through the sense organs into a meaningful experience in mind. This is 1. Perception, 2. Knowledge, 3.Behavior. Perception, Interpretation and Behavioral Changes (Gürer, 1990). The ability of visual expression of a person improves visual language, and visual language, in turn, enhances visual thought, which ultimately facilitates visual dialogue.

In this sense, two main principles of generation can be mentioned in the process of visual dialogue, which are generally valid for animate and inanimate nature:

- All structures are elements of the super-whole, and each of them consists of sub-fragments.
- Forms can only be defined and examined through the relations of the elements that constitute them, and their own interactions with other complexes whose sub-fragments they constitute. "The whole is more than the sum of its parts" (Gürer, 1990, Kurdoğlu, 2017).

In this context, there are many studies in which many landscape studies are evaluated and visual analyzes are carried out with different variables.

While Acar et al. (2006) used seven descriptive factors in their study, namely, naturality, variety, attractiveness, liveliness, unity, attention and excitement, Bulut and Yılmaz (2008) listed nine descriptive factors to determine landscape types in theirs: liveliness, landscape variety, harmony, naturality, novelty, impressive, originality, mystery and historical value. Kurdoğlu and Kurdoğlu (2016), on the other hand, used 9 pairs of adjectives (monotonous/active, built-up (artificial)/natural, simple/varied, incomprehensible/ comprehensible, uninteresting/interesting, disunited/united, ordinary/unique, low visual value/high visual value) in the scope of the main criterion of "worth seeing/ not worth seeing". Tarakçı Eren and Düzenli (2017) used 11 pairs of adjectives in their studies: liked/disliked, beautiful/ugly, repelling/attractive, influential/uninfluential, boring/interesting, monotonous/active, tidy/untidy, plain/flashy, legible/illegible, complex/simple and relaxing/distressful. In her study about the shape and color of "the leaf" Kösa (2019) used 5 descriptive factors: the shape of the leaf is influential/uninfluential, the color of the leaf is influential/uninfluential the shape of the leaf is impressive/unimpressive, the color of the leaf is impressive/unimpressive and beautiful/ugly. Yılmaz et al. (2018), on the other hand employed the following 15 descriptive factors: proximity, harmony, contrast, similarity, unity, closure, rhythm, simplicity, balance, common fate, order, continuity, emphasis, scale and figure-ground.

Natural landscape is composed of living environments that are shaped by interaction of animate and inanimate entities within a natural dynamic process, without interference of

mankind. Such environments are subject to constant change and variability. Variability, on the other hand, is the outcome of the impact of nature on the natural landscape by creating such changes as color, texture, measurement, form etc. on topography, climate, water, soil, vegetation and animal stock in complience with the natural rules and conditions (Keçeli and Çelikoğlu, 2014; Gül, 2000). This, in turn, constitutes the natural landscape complexes.

Mankind, who has presently turned their face to natural areas, has been in interaction with natural landscape complexes. Confronted by numerous stimuli as the result of this interaction, man stepped into a process of perception so as to be able to get to know, understand, identify, re-organize and interpret this new situation (Porteous, 1996). In this process, man strives to convey the factor he pays attention to and perceives through his sense organs into his consciousness. Multiple senses of man (sight, hearing, touch and smell) are activated in this effort. However, due to the fact that the first phase of perception of the external world is sight and the perception limit is the widest in sight, the sense of sight comes to fore in perceptual process (Porteous, 1996; Arıkan, 2008; Surat, 2017). Visual perception is employed as an important criterion for the perceptual process of sustainability of natural landscape complexes, identification of their characteristics, and measurement of their values and transformations (Cengiz et al., 2017). It has been noted in numerous research studies that visual perception is influential in determination of preference of spaces and semantic differences. Many researchers, on the other hand, made attempts to explain the process through the criteria they determined for the visual perception in perceptual process. One of such efforts is the "Gestalt Principles of Perception". According to Gestalt theory, some of the aspects of the factor to be perceived in the perceptual process come to fore while others stay in the background. In Gestalt theory, features of the fragments that constitute the whole are kept in the background in visual perception process. Whole, on the other hand, is constituted by principles relating the given visual, like figure-ground relationship, proximity, continuity, similarity, closure, simplicity, common fate, harmony and balance (Erişti and Urgun, 2016). Such principles define the basis for analysis of the compositions of the natural elements that make up the "wholes" in natural landscape areas, either simple or complex. In accordance with Gestalt perception theory, the visual quality of natural and built-up areas is assessed through form, ratio, balance, rhythm, scale, complexity, color, light and shade (Yılmaz et al. 2018).

In this work, photographs from 20 different natural landscape areas located within provinces of Artvin and Rize were evaluated. Natural landscape perception was scrutinized in respect to the Gestalt principles. We determined important perception principles that contribute to intactness of the natural landscape areas, and proposed that these principles should also be employed in decision-making process in planning and design of such areas. We stressed that decisions need to be taken to maintain sustainability of intact natural landscape areas with high aesthetic values in perceptional terms as well. In this respect, we portrayed that landscape components that reflect important perceptional principles in preservation of natural landscapes should be specified, and the nature should be intervened only after taking planning and design decisions compliant with such principles.

In the research, it is assumed that the principles of perception that give meaning to natural landscapes should be revealed and the natural landscape features that these principles are represented should be sustainable. The need to make field use decisions, which is based on the continuity of the features that make natural landscapes meaningful and identity, is also a preliminary acceptance of the study.

MATERIAL AND METHOD

The current study consists of six phases, which were implemented in a systematic research approach including data collection, evaluation and implementations of integration.

1. Step Determination of Natural Landscape Area
2. Step Selection of Photos to be Evaluated
3. Step Preparation of Survey Study
4. Step Implementation of Survey Study
5. Step Statistical Analysis of Results
6. Step Discussion

Phase 1. Determination of Natural Landscape Areas

Different natural landscape areas from the provinces of Artvin and Rize, which are located in Eastern Black Sea Region of Turkey, were specified as the study area (Figure 1). Eastern Black Sea Region is geographically positioned between 36°41' and 42°42' eastern longitudes, and 41°31' northern latitudes. It covers a total area of 35,174 km2. Beginning from the sea level, the elevation of the region increases up to 3,932 m. The region hosts a mountain range of about 250 km, which is positioned in parallel with the coast line and basically composed of volcanic-basic rock masses. The relatively lower mountains in the western sections of the region gradually ascend towards the east. The increase in elevation continues until the peaks of Kaçkar Mountains, which constitute the fourth highest point in Turkey with an elevation of 3,902 m above sea level. Though dominated by Black Sea climatic characteristics, the region has transitional climate zones in the inner sections as the region is bordered by the Eastern Anatolia Region and Central Anatolia Region. Due to its topographic structure, precipitation drastically varies in short distances. Rainfall is heavy and the highest on the coastal line. Besides, the region hosts various living spaces. The coastal ecosystem is made up of generally rock masses and partly sand dunes. There are numerous streams that are surrounded by humid vegetation and scattered farm areas. Low elevations are covered by deciduous forests composed of species like beech, hornbeam and chestnut, and the higher elevations are dominated by forests of coniferous trees including oriental spruce, Eastern Black Sea fir and scots pine, as well as rhododendron bushes within and above the forest belt, and alpines and peatlands in even higher sections. Peaks, on the other hand, are spotted by alpine lakes and steep cliffs. The wide-range forest belt is substituted by hazelnut and tea plantations in sections closer to coastal line. However, most steep and elevated slopes host natural and old forests. Primary human activities in the region include agriculture, animal husbandry, forestry and tourism. Plateaus located in the higher sections have other utilizations besides traditional animal husbandry due to the fact that they attract the attention of both domestic and foreign tourists, which is a clear indicator of their being important sources of income for the region. Beekeeping is another major economic activity in the region. Hazelnut and tea plant are widely and intensively cultivated around the region. Fishing, on the other hand, is exclusive to coastal line (Kurdoğlu and Çokçalışkan, 2011; Yıldırım et al., 2013; URL-1, 2019). Variety of plant species creates unique beauties across seasons. Forests, bushes, rhododendrons, mountains, waterfalls, and streams portray a wide variety of landscape sceneries.

Rize and Artvin provinces have been chosen as a study area since the Eastern Black Sea Region is intact compared to other provinces in the Eastern Black Sea Region and represents the region as a pioneer with its natural landscape features.

Figure 1. Distribution of Selected Natural Landscape Area Photos on the Map

Phase 2. Selection of Photos to be Evaluated

There exist numerous approaches employed and discussed in evaluation of visual perception of photographic natural landscape areas. According to Buhyoff and Wellman (1980), Schroeder and Daniel (1980), Brown and Daniel (1984), Brown and Daniel (1987), Ribe (1990), and Clay and Smidt (2004), the perceived visual quality differences can be reliably assessed with the help of photographs. Besides, such research studies (Zube et al., 1982, Daniel and Vining, 1983) indicated that quantitative relationships between image-based assessments and physical landscape characteristics could be improved in a consistent way (Clay and Smidt, 2004). We preferred the same method in order to assess the visual characteristics of natural landscape areas in parallel with the above mentioned approaches and to reveal which Gestalt principles of perception are more prominent in visual perception.

Photographs of 20 different natural landscape areas with varying characteristics within natural landscape area were chosen in different seasons (Figure 2). The photographs were selected form the archive of The Eastern Black Sea photographs of Oğuz Kurdoğlu(Kurdoğlu,2005-2015).Each photo frame was given a number. While choosing the photographs of the study area, 20 photographs were determined by the expert group, among the large photo albums that highlight the natural landscapes of Artvin and Rize. While determining the photographs, the experts took care to represent the different

abiotic and biotic landscape components of the selected provinces in their natural landscapes. At the same time, trying to balance the effect of different seasons in the selection of photographs.

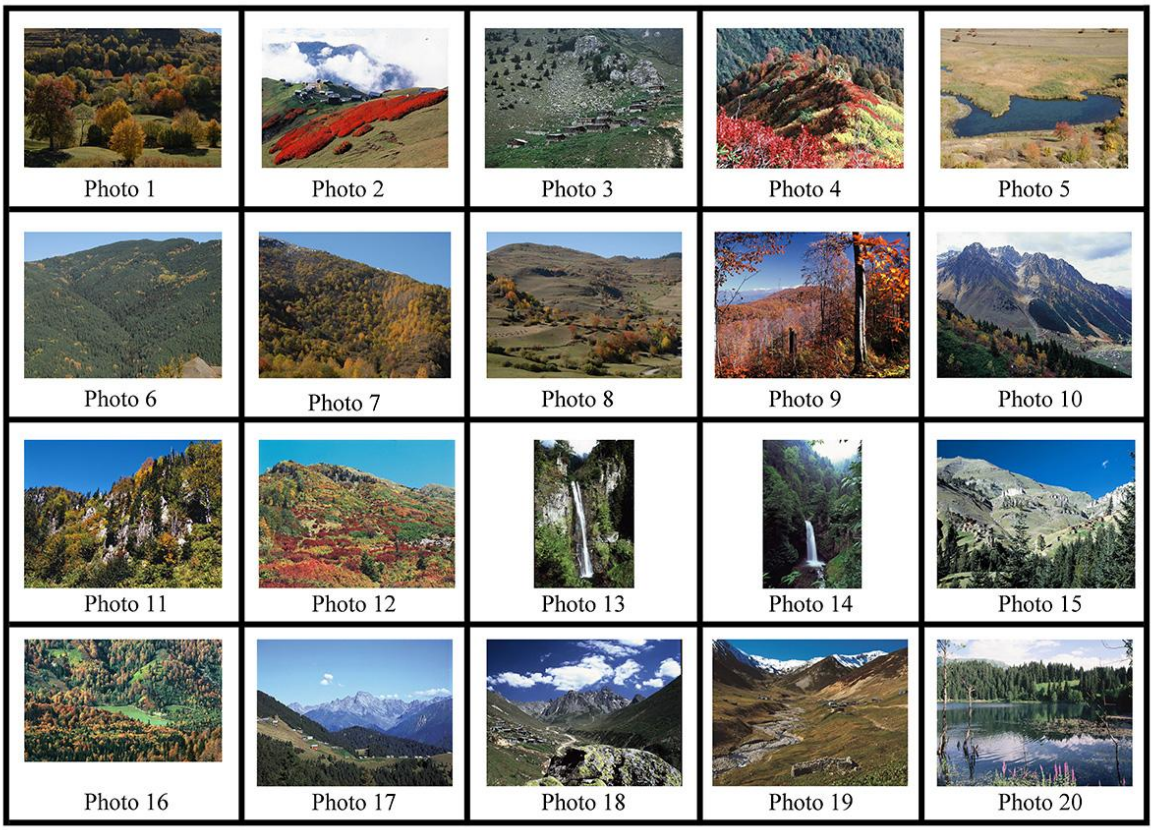

Figure 2.Photographs chosen in natural landscape areas

Phase 3. Creation of Questionnaire Study

A questionnaire study was written to determine the visual perception preferences of the participants on the photographs of the study area. Gestalt principles were used as the basis in questions directed to participants. In the scope of the study, a semantic differential scale was created for each principle of perception (Figure 3). This scale is frequently employed in visual perception studies (Acar et al., 2006; Kurdoğlu and Kurdoğlu, 2016; Yılmaz et al., 2018). The images correlated with visual perception principles were scored 1 to 7 in respect to semantic descriptors. Some of the criteria used by Acar et al. (2006), Bulut and Yılmaz (2008), Kurdoğlu and Kurdoğlu (2016), Tarakçı Eren and Düzenli (2017), Yılmaz et al. (2018), and Kösa (2019) were also used here. In the semantic differential scale created, a scoring system was created to express 1 point no, 2 points very low, 3 points less, 4 points medium, 5 points less good, 6 points good and 7 points very good. These parameters have been revealed as a result of examining the previous studies.

Dissimilar	1	2	3	4	5	6	7	Similar
Without a Self-Identity								With a Self-Identity
Dysfunctional								Functional
Not aesthetic								Aesthetic
Complex								Plain
Ordinary								Unique
Static								Active
Imbalanced								Balanced
Without Unity								With Unity
Without Dominant Characteristics								With Dominant Characteristics
Without Continuity								With Continuity
Without a Figure-ground effect								With a Figure-ground effect
Remoteness								Proximity

Photo Number	Similar	With a Self-Identity	Functional	Aesthetic	Plain	Unique	Active	Balanced	With Unity	With Dominant Characteristics	With Continuity	With a Figure-ground effect	Proximity
1													
2													
3													
⋮													
20													

Figure 3. Semantic Differential Scale Questionnaire Prepared According to Gestalt Perception Principles

Phase 4. Implementation of Questionnaire Study

The questionnaire was responded by a total of 50 participants, 14 students from the Department of Landscape Architecture, 13 students from the Department of Urban and Regional Planning, and 13 students from the Department of Architecture. Photo frames were used for visual assessment. The effect of the natural landscape and its components on visual perception were stated by each observer.

In the current study, 20 photo frames shot in winter, spring, summer and fall were presented to the participants for evaluation. In this phase, each participant responded to a 7-point scoring scale for each natural landscape area. They were given about 2-3 minutes to evaluate each frame. It took about 40 minutes in total for each student to complete the entire questionnaire.

Phase 5. Statistical Analysis of Gathered Data

The gathered data, visual perception preference scores and semantic descriptors were analyzed in SPSS (Statistical Package for the Social Sciences) program. Based on the average values calculated in all the scores, visual perception ratings were specified to determine general patterns of preference.

Non-parametric correlation analysis was run so as to define the correlation between visual perception and the related descriptive variables. A factor analysis is generally made to specify a smaller number of factors and variables by calculating the correlations between variables (Kurdoğlu and Kurdoğlu, 2010). This analysis enables researchers to investigate several common factors of many different variables. Therefore, this analysis was run to determine the sub-factors and the principles of perception that are the most prominent in visual perception of the natural landscape components in the study area.

Kaiser-Meyer-Olkin (KMO) test, which is an index used to test the suitability of factor analysis (Saraçlı, 2011), was also applied within the factor analysis.

Rotation of the original factors is maintained through factor analysis, and this gives way to generation of new factors. Moreover, this analysis helps planners by proposing alternative solutions for a given problem. Rotation of factors is performed in two ways: orthogonal and oblique factor rotation. In the analysis group known as "orthogonal factor rotation", the "*varimax*" rotation method, which maximizes the variance, is used, and thus the cumulative variance of factor loadings is maximized (Kurdoğlu and Kurdoğlu, 2010). In our study, photo frames that bear characteristics of natural landscape were assessed in terms of each visual perception principle, and gathered data were evaluated through factor analysis (varimax rotation).

FINDINGS

The first step to analyze the data in hand was to investigate the correlation between factors (variables) by running a non-parametric correlation analysis on SPSS program. As a result of this analysis, we detected:

- a significant relationship between the factor "unity" and the factor "balanced" with a correlation value of 656 ($p \leq 0.000$),
- a significant relationship between the factor "unique" and the factor "aesthetic" with a correlation value of 645 ($p \leq 0.000$),
- a significant relationship between the factor "aesthetic" and the factor "identity" with a correlation value of 624 ($p \leq 0.000$),
- a significant relationship between the factor "unique" and the factor "identity" with a correlation value of 594 ($p \leq 0.000$),
- a significant relationship between the factor "continuity" and the factor "unity" with a correlation value of 555 ($p \leq 0.000$),
- a significant relationship between the factor "continuity" and the factor "balanced" with a correlation value of 487 ($p \leq 0.000$),
- a significant relationship between the factor "proximity" and the factor "unity" with a correlation value of 478 ($p \leq 0.000$),
- a significant relationship between the factor "proximity" and the factor "continuity" with a correlation value of 453 ($p \leq 0.000$) (Table 1).

Table 1. Non-Parametric Correlation Analysis

			Similar	With a Self-Identity	Functional	Aesthetic	Plain	Unique	Active	Balanced	With Unity	With Dominant Characteristics	With Continuity	With a Figure-ground effect	Proximity
Spearman's rho	Similar	Correlation Coefficient	1,000												
		Sig. (2-tailed)	.												
		N	1000												
	With a Self-Identity	Correlation Coefficient	,094**	1,000											
		Sig. (2-tailed)	,003	.											
		N	1000	1000											
	Functional	Correlation Coefficient	,058	,431**	1,000										
		Sig. (2-tailed)	,066	,000	.										
		N	1000	1000	1000										
	Aesthetic	Correlation Coefficient	,050	,624**	,376**	1,000									
		Sig. (2-tailed)	,112	,000	,000	.									
		N	1000	1000	1000	1000									
	Plain	Correlation Coefficient	,221**	,100**	,106**	,063*	1,000								
		Sig. (2-tailed)	,000	,002	,001	,048	.								
		N	1000	1000	1000	1000	1000								
	Unique	Correlation Coefficient	,001	,594**	,314**	,645**	,122**	1,000							
		Sig. (2-tailed)	,972	,000	,000	,000	,000	.							
		N	1000	1000	1000	1000	1000	1000							
	Active	Correlation Coefficient	,009	,390**	,305**	,418**	-,115**	,430**	1,000						
		Sig. (2-tailed)	,773	,000	,000	,000	,000	,000	.						
		N	1000	1000	1000	1000	1000	1000	1000						
	Balanced	Correlation Coefficient	,291**	,339**	,271**	,418**	,236**	,341**	,233**	1,000					
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	.					
		N	1000	1000	1000	1000	1000	1000	1000	1000					
	With Unity	Correlation Coefficient	,328**	,419**	,237**	,439**	,269**	,397**	,227**	,656**	1,000				
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	.				
		N	1000	1000	1000	1000	1000	1000	1000	1000	1000				
	With Dominant Characteristics	Correlation Coefficient	-,030	,416**	,279**	,334**	,095**	,385**	,256**	,210**	,251**	1,000			
		Sig. (2-tailed)	,348	,000	,000	,000	,003	,000	,000	,000	,000	.			
		N	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000			
	With Continuity	Correlation Coefficient	,286**	,328**	,220**	,357**	,214**	,335**	,230**	,487**	,555**	,237**	1,000		
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	.		
		N	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
	With a Figure-ground effect	Correlation Coefficient	,030	,371**	,258**	,352**	,134**	,365**	,208**	,302**	,336**	,312**	,346**	1,000	
		Sig. (2-tailed)	,344	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	.	
		N	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
	Proximity	Correlation Coefficient	,287**	,328**	,204**	,337**	,163**	,306**	,216**	,410**	,478**	,195**	,453**	,348**	1,000
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	,000	.
		N	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

In the second step, directions of factors were revealed by implementing varimax rotation in factor analysis of the variables. As the result of this, we specified 2 groups of factors, where only factors with a minimum correlation value of 500 were included. The first group was called "self-identity", and comprised sub-factors of aesthetic, unique, dynamic, dominant, functional and figure-ground, and the second group was called "unity", which included the sub-factors like similarity, balanced, continuity, proximity and plain (Table 2). The factors effective in an area's having a self-identity, being unique and aesthetic and the components of natural landscape that create those factors were discussed in two sample photo frames. Similarly, factors effective in an area's having unity and the components of natural landscape that create those factors were discussed in two sample photographs (Figure 4).

Table 2.Rotated Component Matrix

	Component	
	1	2
Similar	-,157	,681
With a Self-Identity	,786	,162
Functional	,565	,124
Aesthetic	,781	,210
Plain	-,066	,540
Unique	,786	,155
Active	,656	-,046
Balanced	,358	,683
With Unity	,406	,720
With Dominant Characteristics	,600	,058
With Continuity	,361	,650
With a Figure-ground effect	,531	,256
Proximity	,325	,597

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Factors influencing the with a self-identity, unique and aesthetics of the area and the natural landscape components that create these factors are as follows:

With Dominant Characteristics: Red ***"Rhododendron luteum"*** with autumn coloring.
With a Figure-ground effect: Ground green meadows, the figure is also the dominant characteristics **"Red *Rhododendron luteum*"** s.
Active: The effect of clouds and topography
Functional: Life

Green-red contrasts reveal red as the dominant characteristics. It creates **a perception from contrast to unity.**

With Dominant Characteristics: Palovit Waterfall
With a Figure-ground effect:
--Ground: Green forested area, green with frequent and impervious texture. In addition, the stream where the water is poured.
--Figure: Palovit waterfall appear to be dominated by the milky white color.
Functional: Landscape function, recreation function, protected area function.
Active: Stream of waterfall

As the dominant characteristics, the milky white-colored Palovit Waterfall appears. It creates **a perception from contrast to with unity.**

Factors influencing the unity of the area and the natural landscape components that create these factors are as follows;:

Similar: Seasonal coloration and harmonious autumn colors creating woodlands, water, meadow color harmony.
With Continuity: Repeating vegetative elements.
Balanced: Measure and dispersion equilibrium of other landscaping components together with the water element in the middle.
Proximity: The intervals of repeating vegetative elements.

The harmony with harmonious autumn coloring consists of continuity, proximity and balance effect. It creates **a perception that goes from harmony to unity.**

Similar: Woodland that create a harmonious color effect.
With Continuity: Repeating vegetative elements and topography.
Balanced: Measure and distribution balance of vegetative elements and topography
Proximity: The intervals of repeating vegetative elements.

The harmony with harmonious autumn coloring consists of continuity, closeness and balance effect. It creates **a perception that goes from harmony to unity.**

Figure 4. Factors and natural components

Maximum and minimum values, as well as average values and standard deviations of the factors were determined through descriptive statistics performed, which indicated a positive result as the average values of all the factors were around 4-5. The unity factor turned out to be more dominant compared to others with a value of 5.0430 (Figure 5).

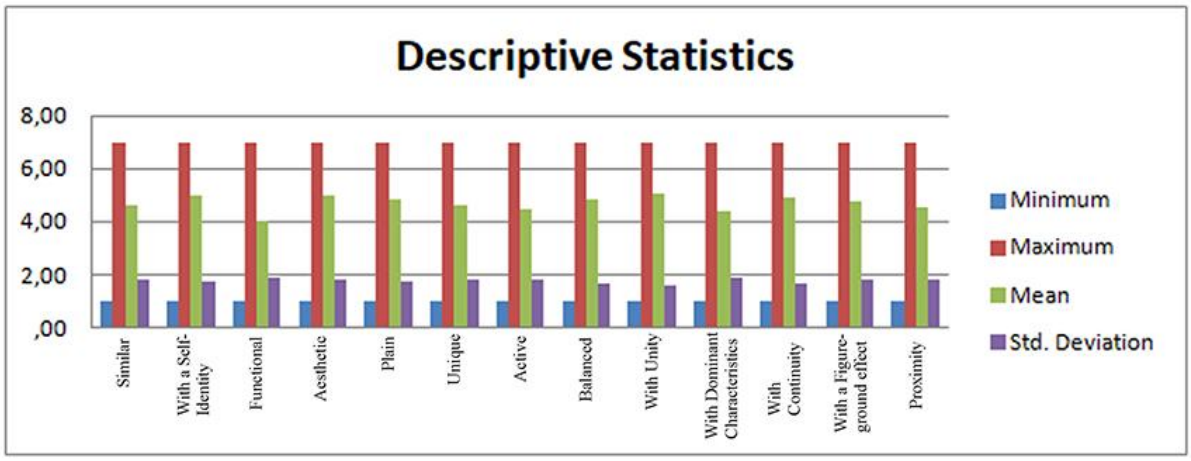

Figure 5.Descriptive Statistics

DISCUSSION AND CONCLUSIONS

In the scope of the study, evaluations were performed in terms of factors that had been discussed in similar studies conducted before. "Semantic Differential Scale", which is frequently appealed to in visual evaluation analyses, was employed in specifying factor groups that are effective in perception of natural landscapes. This study discussed the following factors: with a self-identity /without a self-identity, aesthetic/not aesthetic, unique/ordinary, active/static, with dominant characteristics/ without dominant characteristics, functional/dysfunctional, with a figure-ground effect/without a figure-ground effect, with unity/without unity, similar/dissimilar, balanced/imbalanced, with continuity/without continuity, proximity/remoteness and plain/complex. In this study, we used a 7-point scoring scale like Acar et al. (2006), Bulut and Yılmaz (2008), Kurdoğlu and Kurdoğlu (2016), Tarakçı Eren and Düzenli (2017), Yılmaz et al. (2018), and Kösa (2019) did.

The factor analysis run on the data gathered relating the perception of natural landscapes revealed that the effective factors were grouped into two. When these two groups were examined, we saw that the notion of "unity", which is among primary design principles, and two ways related to it came to fore. First one is the way "from contrast to unity", and the latter is "from harmony to unity". While solving the basic design problems, they are called the lower and the upper way, and they bear the principles of dominance and balance. The effects of principles grouped under these two headings were also detected in visual landscape perception. The first group was called "self-identity", and comprised sub-factors of aesthetic, unique, dynamic, dominant, functional and figure-ground, and the second group was called "unity", which included the sub-factors like similarity, balanced, continuity, proximity and plain. The figure-ground factor, dominant element factor and liveliness factor, functionality factor, all of which are effective in evaluation of a natural landscape as having a self-ID and being unique in the direction from contrast to unity, were grouped together. On the other hand, the proximity factor, similarity factor, continuity factor and balanced factor, which are effective in evaluation of a natural landscape as having unity in the direction from harmony to unity, were grouped together.

Performance of factor analysis on these factors indicated similar average values, around 4-5 points. The "unity" factor scored the highest value, 5.0430. This result indicates that participants of the questionnaire study agreed that "unity" has a value above the average level in the entire photo frames presented to them. When a non-parametric correlation analysis was run on these factors, correlations were spotted between factors like unity-balanced, unique-aesthetic, aesthetic-identity, unique-identity, continuity-unity, continuity-balanced, proximity-unity and proximity-continuity at a significant level.

Similarly, Acar et al. (2006) detected a significant relationship between admiration and excitement, while its correlation with liveliness was a slight one. Kurdoğlu and Kurdoğlu (2016), on the other hand, found a significant correlation between all adjective pairs they used in their work. Moreover, they spotted a positive correlation between "worth seeing" condition and all adjective pairs at a significant level. Bulut and Yılmaz (2008) detected a positive correlation between the landscape types of urban, natural, geological structure, valley, dam, flora and authentic and semantic descriptors of liveliness, variety, harmony, naturality, novelty, effectiveness, originality, mystery and historical value at a significant level. Kösa (2019) reported a significant relationship between the coherence of the shape and the color of the leaf, influentiality of the color of the leaf, influentiality of the shape of the leaf, impressiveness of the leaf and the beauty of the leaf. The criterion scale we discussed in the study enabled us to reveal two different factor groups. The criteria collected in the two groups support each other in the interpretation of natural landscapes. Therefore, the results of this study serve as an example for natural landscape assessments to be carried out in other studies.

Tarakçı Eren and Düzenli (2017) found out that the adjectives of attractive, legible and influential were the most effective ones. Yılmaz et al. (2018) created silhouettes with rhythmical repetitions by organizing groups of plant species with different form and textures in accordance with the descriptive factors of order and harmony.

This study is essentially the photographic evaluation of some special natural landscape areas located within protected zones of the Eastern Black Sea Region, Turkey. It will obviously contribute in determining the underlying factors that make an area unique, aesthetic, with a self-identity, and taking planning and design decisions that will maintain the sustainability of these factors. Factors that take us from contrast to unity, and from harmony to unity were analyzed on photo frames that we examined in terms of factors included in the groups. Planning decisions should be taken to ensure the sustainability of such characteristics as color, texture and form of the components of the natural landscape perceived under the influence of these factors, taking into consideration the seasonal transformations. While interfering with natural landscapes, limitations should be introduced in the light of such evaluations, and a sustainable planning process should be sampled. In this way, natural landscapes can still preserve their uniqueness, aesthetic features and self-identities, even if they offer various utilizations of recreation or tourism. In the natural landscapes scrutinized in the scope of the study, **images that depict contrast, figure-ground effect and with a dominant element are perceived as unique, aesthetic and with a self-ID**, with partial contribution of the seasonal transformations. In parallel with that, **images presenting harmony, repetition, similarity and proximity create a "unity effect".** While the results we attained verify the findings of many other earlier studies in that harmony and contrast is influential in creating a unity, they also revealed that the perceptional process that moves from **contrast to unity** has a significant effect on **being unique and having a self-ID specific to natural landscapes.** Therefore, it is clear that the most important point to bear in mind while using natural landscape areas with such characteristics is to maintain the sustainability of their peculiar features of being unique, and preferred and favored by users. Sustainability of tourism and recreation activities in natural areas is only possible with protecting the unity created by the variety and uniqueness of the nature, the main capital, without destroying it. The variety of the physical environment that exists in the natural landscape, facilitated by seasonal transformations, is sometimes perceived with movements in a waterfall, a lake or topography, sometimes in the form of color-texture-form differences in the vegetation and sometimes in the flow of skies.

The results obtained in the study are very important for many sectors such as tourism, urban planning, forestry, agriculture and conservation. Many professional disciplines such as those that interfere with natural areas ignore their sustainability while meeting their needs related to that area. This situation causes the nature of the natural landscapes to

deteriorate and the reasons for preferences for different purposes disappear. Other disciplines that interfere with natural landscapes should recognize the area in parallel with these study results and establish uses and interventions that will ensure the sustainability of their eigenvalues.

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