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Exploring Landscape Perceptions of Bukhansan National Park According to the Degree of Visitors' Experience

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Abstract: This study explores differing landscape perceptions of Bukhansan National Park according to the degree of visitors' familiarity, and discusses the utilization of commonality and diversity of landscape perception in sustainable landscape management. Visitor-employed photography (VEP) was used to capture the overall response to experiencing landscape directly on-site. According to the degree of familiarity of national parks, visitors were recruited into two groups: inexperienced group (the novice group) and experienced group (the veteran group). We collected photographs and photo-logs of liked and disliked landscape from the participants. Additional interviews were conducted to supplement the content of the photo-logs. The objects of landscape were classified into spatial configurations and specific elements. The cognitive process of landscape perception is divided into four stages: perceptual, expressive, interpretative, and symbolic. Emphasizing the narrative aspects of landscape, accepting and interpreting the phenomenon can vary according to an individual's interest and background. We used semantic network analysis to analyze the content of participants' photo-logs. The content at the interpretative level showed that the two groups had very different perceptions of anthropic elements. The novice group emphasized walkability and accessibility, while the veteran group regarded naturalness and historicity as more important. In conclusion, it is a very useful way to analyze the differences of perceptions of two visitors, both the novice group and the veteran group to grasp the positive or negative perceptions of people's impacts on the landscape. Understanding the value of relevant visitors through analysis results is one way to resolve potential conflicts.

Keywords: landscape preferences; on-site landscape perception; familiarity; visitor employed photography; semantic network analysis; national parks management

1. Introduction

Public perception-based approaches [1–4] to assessing landscape quality have been actively used in landscape assessment studies, complementing the shortcomings of expert-led approaches [5–7]. Based on the European Landscape Convention (ELC), efforts are being made to reflect public perception within landscape management and policy in practice. As a representative example, within the UK, the Welsh Government includes public perception indicators in its framework for landscape assessment [8]. Consideration of public perceptions becomes an essential process for sustainable landscape management.

Early research on landscape perception analyzed the psychophysical or psychological responses of members of the public to photographs taken by the researchers as representations of the

environment [9,10]. However, because of the limited range of view and the composition of the photographs can affect visual preferences, the validity of such approaches was questioned on the basis of whether photography can replace reality [11–14]. One way to solve this problem is to study landscape perception directly on-site [14–16]. This attempts to minimize distortion in representing the interaction that occurs in human experience in the natural environment [15,17,18].

The object of landscape perceived by humans can be classified into spatial configurations and specific elements of landscape [19]. Spatial configurations are related to the organization and composition of the landscape elements, and influenced by the depth and breadth of view [20]. On the other hand, specific elements emphasize experience and interaction, with attention to distinctive elements and subtle details [21].

The cognitive process of landscape perception is divided into four major levels of knowledge or sense (perceptual, expressive, interpretative, and symbolic) [22]. At the perceptual level, the beholder immediately acquires relevant information through the sensory organs. The expressive level is related to the beholder's feeling regarding perceived elements or structures. The interpretative and symbolic levels refer to what is behind the physical object: The interpretative level understands and interprets the object as signs or symptoms, whereas the symbolic level goes beyond the reality of the interpretative level, thus ultimately reaching the level of imagination (see Table 1). Nohl argues that the perceptual and interpretative levels contribute to the narrative function; and the expressive and symbolic levels to its poetic function [22].

Table 1. Cognitive process of landscape perception (complied from [22]).

Cognitive Process	Description
Perceptual	The beholder captures some information through the sense, such as by viewing, hearing, touching or smelling.
Expressive	All perceived elements and compositions are associated by the beholder with feelings and emotions.
Interpretative	The beholder already has to know something about the landscape if they want to be get on this level of cognition. For example, a sandbank may talk of the rivers low water power.
Symbolic	Landscape realities become ideas, imaginations, utopian images, which are generated in the head of the beholder.

The four levels of the cognitive process can be divided into evolutionary and cultural theories [23]. The evolutionary perspective, which emphasizes human instincts such as natural survival, corresponds to the levels of perception and expression, whereas the cultural perspective, which emphasizes individual characteristics formed by acquired factors, corresponds to the interpretative and symbolic levels [1,24].

In this study, conceptual framework is presented to understand commonality and diversity of perception. First, the objects of landscape are divided into spatial configurations and specific elements as well as ephemeral events. Ephemeral events are the effects of time constraints such as weather, sunlight, color, and seasons [23,25]. These events also improves extraordinary experience of landscape [19]. Then, the perception of landscape was divided into four levels of cognitive process. The perceptual and expressive level of the cognitive process emphasize the commonality of landscape perception based on evolutionary theory, and the interpretational and symbolic level can grasp the diversity of perception based on the cultural theory (see Figure 1).

Interpretative and symbolic levels that emphasize the importance of cultural influences can be greatly influenced by factors such as familiarity and affinity with particular environments [26–30]. For rural landscape, visitors (low familiarity) prefer a traditional rural landscape dominated by natural elements, while local farmers (high familiarity) prefer productive, well-organized landscapes [31]. Long-term residents are more likely to engage in more detailed and less attractive elements, including

more constructive critiques and advice [31]. In the case of rural landscapes, it can be seen that the greater the attachment, the more interpretative and symbolic is the perceived value of the landscape. For the natural landscape such as Mt. Everest, foreign tourists prefer scenic beauty, while local residents (Sherpa) have a difference in landscape perception that the mountain is considered beautiful by utilitarian reasons [27].

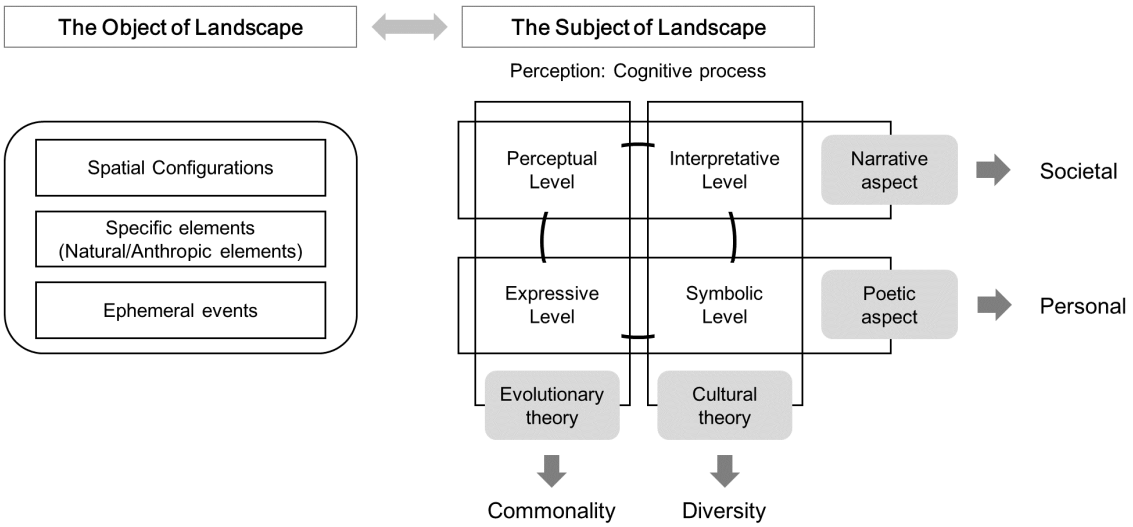


Figure 1. Types of the object of landscape and cognitive process of landscape perception.

Sustainable landscape management should start with assessing the characters of the landscape, not merely the beauty of the landscape. Tveit et al. [23] proposed nine landscape character concepts (visual scale, coherence, complexity, naturalness, disturbance, stewardship, historicity, imageability, and ephemera) through extensive review of previous studies (see Table 2). These concepts can be divided into four levels of the cognitive process based on theories. Perceptual level includes visual scale, coherence, and complexity; expressive level includes ephemera; interpretative level includes naturalness, disturbance, and stewardship; and symbolic level includes historicity and imageability.

Table 2. Concepts of landscape character (complied from [23,32]).

Concept	Description	Theory
Visual Scale	Landscape rooms/perceptual units in relation to their size, shape and diversity, and the degree of openness in the landscape	Prospect-refuge theory, Habitat theory
Coherence	The unity of a scene, the degree of repeating patterns of color and texture as well as a correspondence between land use and natural conditions	Information processing theory
Complexity	The diversity and richness of landscape elements and features and the interspersion of patterns in the landscape	Information processing theory, Biophilia hypothesis
Naturalness	The perceived closeness to a preconceived natural state	Biophilia hypothesis
Disturbance	The lack of contextual fit and coherence in a landscape	Information processing theory, Biophilia hypothesis
Stewardship	The sense of order and care present in the landscape reflecting active and careful management	Aesthetics of care
Historicity	The degree of historical continuity and richness present in the landscape	Topophilia
Imageability	The ability of a landscape to create a strong visual image in the observer and thereby making it distinguishable and memorable	Spirit of place, Topophilia, Vividness
Ephemera	Landscape changes related to season or weather	Restorative environments

This study analyzes differences in landscape perceptions according to the degree of visitors' experience of national parks as a typical leisure and recreational space. The study explains the commonality and diversity of landscape perceptions of the two groups (the novice group and the veteran group), as response of cognitive process (perceptual, expressive, interpretative, and symbolic). In addition, we suggest how the findings can be applied to sustainable landscape management. This study is based on the following hypotheses:

- The novice group is more active response in the perceptual and expressive level than the veteran group.
- The veteran group is more active response in the interpretative and symbolic level than the novice group.
- The veteran group is more critical than the novice group on the naturalness, disturbance, and stewardship of landscape character concepts.

2. Materials and Methods

2.1. Study Site

Bukhansan National Park is a Category V Protected Landscape/Seascape according to the classification system of the International Union for the Conservation of Nature (IUCN). It is the 15th national park designated in South Korea (5 April 1983), and covers an area of 78.5 km^2, including Mt. Bukhansan and Dobongsan, and the highest peak Baekundae (837 m elevation) [33]. The park is adjacent to Seoul Metropolitan City, and is the most visited national park in South Korea, currently attracting approximately 10 million tourists annually (one-fifth of the total South Korean population) [34] (see Figure 2).

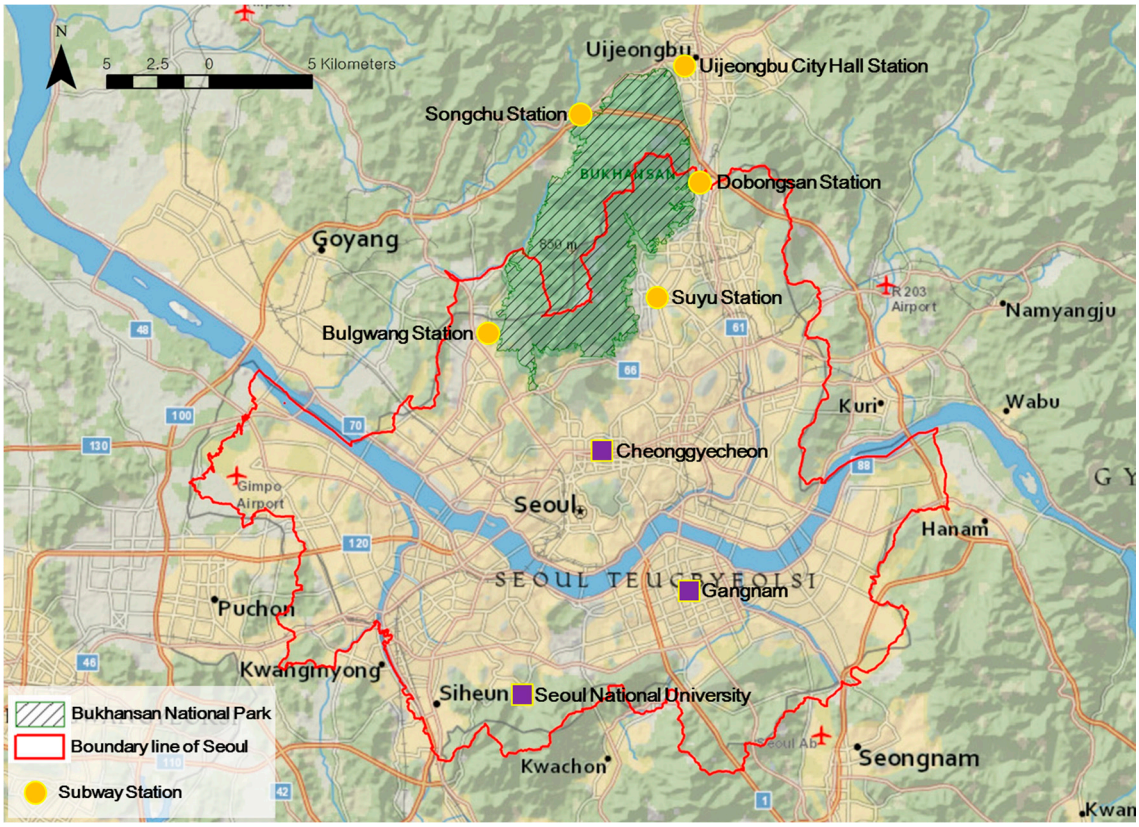


Figure 2. Locations of Seoul and Bukhansan National Park.

The Bukhansanseong trail course was selected as the study area, based on the following criteria:

- A site with high usage density
- A site that can be visited for one-day trips to a mountain-top destination
- A place where one can experience various scenic resources of Mt. Bukhansan

As mentioned above, one type of the object of landscape, spatial configurations, is primarily influenced by the depth or breadth of view. The location of the beholders in experiencing of landscape is very important. Therefore, we divided into four units according to the similarity of vegetation and geographical features around the trail that can affect the depth and breadth of view. The total length of the trail is 3.4 km, along which four visually distinguishable units were identified (see Figure 3):

- Unit A (0–800 m from the trail start): The area in which most traces of past villages remain. The facilities of old villages have been demolished, and the vegetation has been restored ecologically. Some of the existing buildings have been retained and used for other purposes.
- Unit B (800–1600 m): A stream runs adjacent to the trail, which is surrounded by pine, mixed deciduous, and coniferous forest, with oriental oak forest distributed around the trail.
- Unit C (1600–3200 m): Dominated by oriental oak forest. This section of the trail has the shortest depth of view, due to the high stand density.
- Unit D (3200–3400 m): This section is a dry and rocky ridge. The length is very short compared to the other units, but it is included as a unit in consideration of being a final destination; and due to its characteristics, with the furthest and broadest panorama.

Figure 3. The concept map of elevation, gradient, vegetation, and representative landscape photos of each unit of the trail.

2.2. *Visitor Employed Photography (VEP)*

Visitor-employed photography (VEP) is a useful way of directly grasping landscape perception that emphasizes on-site experience [35]. It was first developed and used in the United States in the 1970s [36]. The progress of the VEP method can be applied very flexibly depending on the situation.

The method of recruiting of survey participants, the type of photographic equipment, the limitation of the number of photographed pictures, the type of content to be filled in the photo-log, and whether to conduct additional interviews may vary depending on the purpose of the study. The success of the VEP method depends on how effectively you can capture moments of interaction with humans and nature.

The early VEP method was used to quantitatively analyze the perceptual response of physical objects, by transferring experimental esthetics in the laboratory to the fieldworks. This method revealed consensus photographs (CP), in which the same objects appeared very frequently in pictures taken by participants; and perceptually exciting nodes (PEN), the representative node where these photographs were taken [36]. Early VEP studies showed the methodological possibility of directly grasping perception of the landscape in a real context, and of identifying their commonality.

Since the late 1990s, the trend in VEP research has shifted from the commonality of landscape perception to the diversity of human cognitive responses based on environmental psychology. Many types of research have focused on identifying the characteristics of landscape perception according to various groupings such as age, or residents versus tourists [31,37–41]. In addition, a number of studies suggest ways to manage landscapes and trails through various landscape perceptions [20,42,43].

Based on recent research findings, we examine whether the degree of visitors' familiarity with the national park could be an important variable for the diverse perceptions of the site. Furthermore, we discuss the ways in which the two groups' various perceptions could be in line sustainable landscape management practice.

2.3. Data Collection

A survey was conducted twice, on 19 and 26 June 2016, from 10:00 a.m. to 4:00 p.m. The survey volunteers consisted of a novice group with little experience of visiting national parks, and a veteran group who had visited national parks at least once a month for 10 years.

Participants recruited to the novice group (n = 8) were limited to those who had made less than one or two visits to the national park. Purposive sampling (through Internet-organized groups and blog searches, individual contacts, and professional links) was used to recruit participants for the veteran group (n = 8). Inclusion criteria were: members of the general public who do not have relevant expertise such as landscape or ecology, who made more than one visit per month to the national park for more than 10 years.

An on-site survey and landscape photographing were conducted from 10:00 a.m. to 2:00 p.m., followed by individual interviews from 2:00 p.m. to 4:00 p.m. The participants were asked to photograph landscapes that they "liked" and "disliked" while walking along the trail, documenting some information about their photos and experieces in a photo-logs from the entrance to the top of the mountain. All the photographs and photo-logs were collected after the participants returned to the departure point. The photo-logs asked such questions as: (a) "What attributes of landscape did you photograph?" (b) "From where did you photograph?" (c) "Describe why you choosed these attributes of landscape to photograph?".

Additional short interviews were conducted with all participants. The purpose of conducting additional interviews is to prepare for the possibility of missing records. The interviews took place inside the building (coffee shop) near the entrance of the national park. The interview time was limited to about 20–30 min per person. We conducted face-to-face interviews so that the repondents could express his or her thoughts as much as possible without being interrupted by other people's comments. The interview method utilized the free-listing method. The method is similar to an open-ended question by allowing respondents to freely list what they are aware of on a topic [44,45]. Viewing the pictures one by one in order of the photographing time with the participants, we asked "Why did you take a photo? Please answer anything that comes to your mind." Next, the participants answered several open-ended questions about the reason for the photos, and the answer was voice recorded and later transcribed for analysis.

All the participants used their own smartphones for digital photography, so that differing proficiency in dealing with the camera would not affect the survey results. Details of the photography process were entered through the photo-logs, such as the subject of a photograph, the reason for taking the image, and the preference (like/dislike). To prevent participants impeding or interfering with each other's photography, they started walking from the departure point at 15 min intervals.

2.4. Semantic Network Analysis (SNA)

Semantic network analysis (SNA) was used to analyze content (text) of the photo-logs. SNA is one of the various methods of analyzing text, which is a qualitative data made up of language. It aims at grasping its meaning through coding and categorization process such as content analysis or grounded theory [46,47].

The difference between SNA and existing qualitative research methods is that the relationship between coded analytical units can be visually recognized. Landscape perception is the result of the cognitive process of the environment. Therefore, the relationship between the object of landscape, which is a part of the environment, and the subject of landscape perception, in which cognitive process occurred in their mind, is very important. In addition, the cognitive process consisting of four levels is not a sequential process but a complex one. In order to analyze landscape perception, it is necessary not only to grasp the main meaning through categorization but also to grasp the relationship between the object and subject of landscape.

As in content analysis, the core of SNA is to establish an "analysis unit", called a "node." In general, not all words in the text are used as nodes. Nodes should be selectively extracted to match the research topic and purpose [48]. The methods of establishing nodes consist of a confirmatory approach based on existing theory, and an exploratory approach by empirical method [49].

The core concept for understanding the relationship between nodes is "proximity", which indicates how close the relationships are between the nodes. In SNA, this concept is expressed as a "co-occurrence" of the nodes [49,50]. It is assumed that nodes within a certain range of text are semantically correlated between all nodes within that range when they occur at the same time [50]. In general, co-occurrence is expressed by the frequency of co-appearance of the nodes in a single nuclear sentence. However, a researcher may limit the scope of the co-occurrence to the nature of the text and the research purpose [48] (see Figure 4).

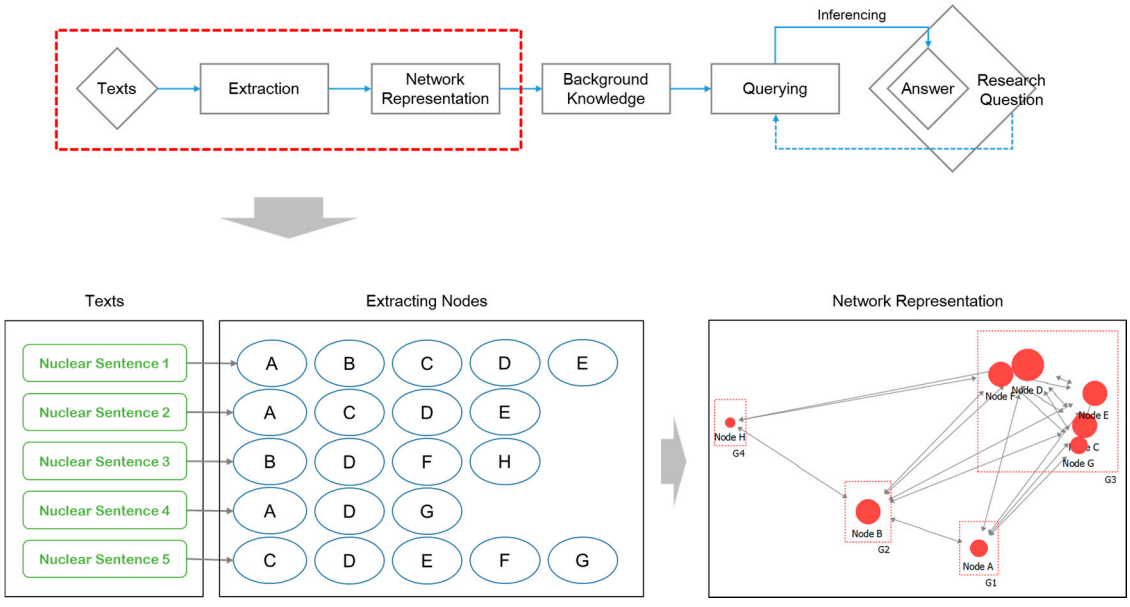


Figure 4. Semantic network analysis and the example of network visualization (complied from [46]).

To fully understand the meanings and concepts given through SNA, one should analyze the variables that have structural characteristics, including "betweenness centrality", "degree centrality", and "community structure" [51]. Betweenness centrality refers to the degree of influence of a certain node that interconnects two different nodes to the formation of the meaning network. Community structure refers to the subgroups created by the interrelationships with the relevant nodes. Degree centrality refers to the importance of meaning in the subgroup. If degree centrality is high in a certain node, then the node is the representative concept of the group [48].

2.5. Data Analysis

The photographs taken by the two groups were classified spatial configurations and specific elements (content-based attributes) according to landscape physical attributes, and then by preference (liked/disliked). Finally, we conducted SNA on positive perception of spatial configurations, natural elements of specific elements, and positive and negative perception of artificial elements. A small number of nodes extracted negative perception of spatial configurations and natural elements did not carry out SNA.

We set up the analysis unit (node) to perform the SNA. The size of the nodes was limited to words and phrases. The content of each picture was considered as a range of co-occurrence frequency. We used an "exploratory approach" to extract nodes: nodes that include the object of landscape, spot (the location where the photograph was taken), ephemeral events, and the level of cognitive processes (perceptual, expressive, interpretative, and symbolic) were selectively extracted (see Figure 5).

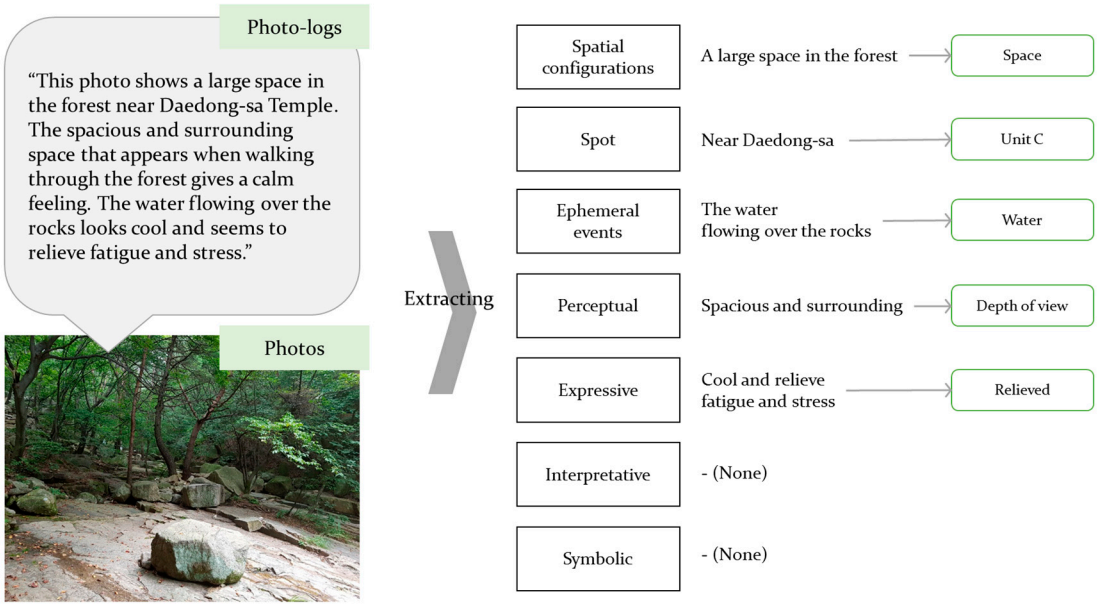


Figure 5. The example of node extraction process on semantic network analysis.

The SNA was analyzed using NetMiner 4.3 social network analysis software. The software which is developed by CYRAM in Korea is a tool for exploratory analysis and visualization of network data. We analyzed betweenness centrality, degree centrality, and community structure based on the co-occurrences between the nodes, the basic concept of the network.

3. Results and Discussion

3.1. Overview of Individual Landscape Perceptions

The total number of photographs was higher in the veteran group (n = 111) than in the novice group (n = 86). In terms of the frequency of the object of landscape photographed, spatial configurations were most common in the novice group (36.0%), versus anthropic elements in the veteran group (44.1%) (see Table 3).

Table 3. Number of photos allocated to each of the two groups and to the individual categories distinguishing between spatial configurations and specific elements.

ID	Preference	Photos	Spatial Configurations	Specific Elements		
				Natural Elements	Anthropic Elements	Subtle Details
Novice	Liked	57	29	18	7	3
	Disliked	29	2	3	19	5
	SUM	86	31	21	26	8
Veteran	Liked	74	29	24	19	3
	Disliked	37	1	3	30	2
	SUM	111	30	27	49	5
Total		197	61	48	75	13

The veteran group included a professional mountaineer, a teacher, self-employed persons, and office workers, most of whom are aged in their fifties. Two participants (KV01 and KV04) first visited the mountain before the 1990s, three (KV03, KV05, and KV06) in the 1990s, and another three (KV02, KV07, and KV08) in the 2000s. As mentioned previously, all members of the group veteran group were regular visitors to the mountain for more than ten years: four participants (KV01, KV03, KV04, and KV05) at least two or three times a month, and the other four (KV02, KV06, KV07, and KV08) at least once a month. The former four were more familiar with the mountain (KV01 professional mountaineer; KV03 local resident; and KV04 and KV05 participating as Civilian Conservation Corps; see Table 4).

Table 4. Demographic features of participants between two groups.

ID	Gender	Age	Occupation	Experience	Frequency (per Month)	Notes
KN01	Female	20	Student	First	None	
KN02	Female	20	Student	First	None	
KN03	Male	20	Student	First	None	
KN04	Female	20	Student	First	None	
KN05	Male	20	Student	First	None	
KN06	Male	30	Student	First	None	
KN07	Female	20	Student	First	None	
KN08	Female	20	Student	First	None	
KV01	Male	50	Mountaineer	From 1980s	More than 2–3	Pro rock climber
KV02	Female	50	Inoccupation	From 2000s	More than 1	
KV03	Male	50	Teacher	From 1990s	More than 2–3	A local resident
KV04	Male	60	Self-employed	From 1970s	More than 2–3	Civilian Conservation Corps
KV05	Male	50	Self-employed	From 1990s	More than 2–3	
KV06	Male	50	Office worker	From 1990s	More than 1	
KV07	Male	50	Office worker	From 2000s	More than 1	
KV08	Male	50	Office worker	From 2000s	More than 1	

The number of nodes allocated to each of the level of cognitive process can be used to understand the tendency for perceptual differences. In the novice group, the number of nodes was high in the perceptual and expressive levels, whereas the veteran group showed a high number of nodes in the interpretative and symbolic levels (see Table 5).

Table 5. Number of nodes allocated to each of the participants and to the individual categories distinguishing the object of landscape (Spatial conf., Specific elements and Ephemeral) and cognitive process.

ID	Total	Spatial Conf./Specific Elements	Spot	Ephemeral	Cognitive Process			
					P [1]	E [2]	I [3]	S [4]
KN01	67	14	11	7	16	11	8	
KN02	70	16	10	6	19	11	4	4
KN03	53	12	10	4	13	9	4	1
KN04	62	14	10	7	11	10	10	
KN05	55	13	10	3	11	6	11	1
KN06	73	17	11	5	13	7	18	2
KN07	64	19	11	6	16	6	6	0
KN08	52	13	10	3	10	9	7	
SUM	496	118	83	41	109	69	68	8
KV01	62	19	13	1	8	4	12	5
KV02	71	20	14	5	7	2	22	1
KV03	82	17	14	2	4	4	38	3
KV04	67	14	12	1	4	4	27	5
KV05	68	17	13	2	10	3	22	1
KV06	68	19	15	0	8	3	12	11
KV07	59	11	11	5	12	4	14	2
KV08	84	22	18	2	12	13	16	1
SUM	561	139	110	18	65	37	163	29

[1] Perceptual; [2] Expressive; [3] Interpretative; [4] Symbolic.

Among the veteran group, those who lived near the national park or were active in the citizen protection group showed a high number of nodes in the interpretative level. However, the number of symptomatic nodes was not significantly different between the novice group and participants who was low frequency of visits (KV06, KV07, and KV08) in the veteran group.

3.2. Differences in Perceptions of Spatial Configurations of Landscape

Regarding the spatial configurations of the object of landscape, the novice group took 31 photos and the veteran group took 30 photos, with 29 pictures liked in each group. The number of nodes extracted from the photo-logs was relatively high in the novice group (n = 174). In detail, the number of nodes corresponding to the perceptual level (n = 46) of the cognitive process was high, whereas the veteran group showed a high number of nodes in the symbolic stage (n = 17).

Analysis of the community structure showed that the two groups included four clusters. The perception considered most important for the spatial configurations of landscape can be identified through the following clusters: Terrain (n = 92) and Forest (n = 46) in the novice group; Terrain (n = 55) and Peaks (n = 50) in the veteran group (see Tables 6 and A1).

Table 6. Number of nodes of liked spatial configurations allocated to each of the landscape attributes and to the individual clusters distinguishing between two groups.

	The Novice Group					The Veteran Group				
	SUM	**Terrain**	**Insubong Peak**	**Forest**	**Mankyoungdae Peak**	**SUM**	**Terrain**	**Peaks**	**Forest**	**Bedrock Space**
Spatial Conf.	43	25	4	12	2	35	15	14	4	2
Spot	29	11	8	2	2	29	14	9	4	2
Ephemeral	17	10	3	4		6		1	2	3
Perceptual	46	34	5	5	2	18	8	8	2	
Expressive	28	9	8	11		21	11	3	5	2
Interpretative	8	3		5		10	4	2	2	2
Symbolic	3		2	1		17	3	13	1	
Total	**174**	**92**	**30**	**46**	**6**	**136**	**55**	**50**	**20**	**11**

Cluster "terrain" of the novice group refers to mountain, mountain peaks, valleys, etc. at a relatively long distance (see Figure 6). At the perceptual level, 34 nodes were extracted that related to the depth and breadth of view (far-sighted, wide-spread, and wide-open). Cluster "forest" represents the atmosphere of three-dimensional space surrounded by trees (see Figure 6). At the expressive level, 11 nodes were extracted that related to stress relief (see Table 7).

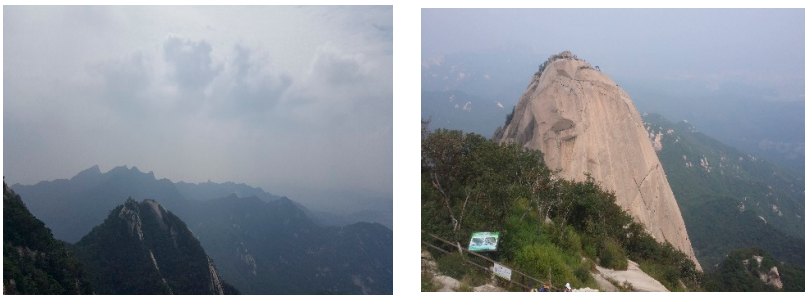
(**a**) (**b**)

Figure 6. (**a**) A representative photo of cluster "Terrain"; and (**b**) a representative photo of cluster "Forest".

Table 7. Contents of nodes and its frequency of liked spatial configurations allocated to each of the main clusters in the novice group.

Cluster	**Spatial Conf.**	**Spot**	**Cognitive Process**			
			Perceptual	**Expressive**	**Interpretative**	**Symbolic**
Terrain	Ridges (6), Mountainous (5), Valley (4)	Unit A (9), Unit C (2)	Far-sighted (5), Coherent (4), Wide-spread (5)	Mystery (4), Expectation (3), Refreshing (1),	Being in the wild nature (1)	
Forest	In the forest (6), Deck road (2), Bedrock area (2)	Unit B (6), Unit C (2)	Be-overgrown (3), Wide (1), Can be seen from close (1)	Cozy (4), Feel better (3), Relieved (2)	Convenient (2) Topographic feature (3)	Going in to unknown space (1)

Cluster "terrain" of the veteran group concerns the mountain peak and the mountain range viewed from the top of the mountain (see Figure 7). The respondents saw the layered mountain range as natural regardless of its close proximity to the city. Cluster "peaks" concerns the recollection of past memories of ascending the mountain trail while looking at the mountain peak (see Figure 7). The respondents regarded the mountain peak as a symbolic element that represented the sense of the place (see Table 8).



(**a**) (**b**)

Figure 7. (**a**) A representative photo of cluster "Terrain"; and (**b**) a representative photo of cluster "Peaks".

Table 8. Contents of nodes and its frequency of liked spatial configurations allocated to each of the main clusters in the veteran group.

Cluster	Spatial Conf.	Spot	Cognitive Process			
			Perceptual	Expressive	Interpretative	Symbolic
Terrain	Mountainous (5), Baegundae Peak (5), Valley (4)	Unit D (9), Unit A (3), Unit B (2)	Unique (5), Coherent (1), Being adjacent to the city (1),	Curious (2), Grandness (4), Expectation (1),	Being in the wild nature (3), Typical Images of national parks (1)	Praying at the top (1), Snowy scene (1), Drawing a painting (1)
Peaks	Insubong Peak (4), Ridges (2), Sangjang Ridge (1)	Unit D (7), Unit A (1), Unit C (1)	Visible at a glance (1), Wide-spread (2), Smooth (2)	Refreshing (2), Thrilled (1)	Representative resources (2)	Memory of the past (6), Rock climbing (4), Wanting to climb again (3)

Both groups were strongly influenced by the depth and breadth of view, and showed a commonality that positively responded to major mountain peaks. On the other hand, there was a difference in the perceptive process of the mountain peaks. The veteran group showed that their perception extended beyond the perceptual level of the morphological characteristics of the mountain peaks, to the symbolic level through its memory of the past.

3.3. Differences in Perceptions of Specific Elements of Landscape

The specific elements of a landscape are largely divided into natural elements, artificial elements, and subtle details. The number of associated photographs is 136 (48 natural elements, 75 artificial elements, 13 subtle details).

The number of "liked" photos of natural elements was 18 in the novice group and 24 in the veteran group. The number of nodes in the photo-logs for each group was similar for the novice (n = 105) and veteran (n = 115) groups. In the novice group, the number of nodes was higher in the expression level (n = 20), and in the interpretative level (n = 20) among the veteran group.

Six clusters were identified in the novice group, and four in the veteran group. The most important perception of "liked" natural landscape elements were Water (n = 47) and Bedrock (n = 31) in the novice group, and Water (n = 52) and Wildflower (n = 28) in the veteran group (see Tables 9 and A2).

Cluster "water" in the novice group and cluster "water" in the veteran group are related to the water resource in the valley (see Figures 8 and 9). Participants prefer flowing water and clean water quality. Therefore, dynamics and clarity, corresponding to the perceptual level, are seen to affect participants' preferences (see Tables 10 and 11).

Table 9. Number of nodes of liked natural elements allocated to each of the landscape attributes and to the individual clusters distinguishing between two groups.

	The Novice Group							The Veteran Group				
	SUM	**Water**	**Rock/Tree**	**Bedrock**	**Wild-Flower**	**Pine Tree**	**Vegetation**	**SUM**	**Water**	**Wild-Flower**	**Rocks**	**Vegetation**
Specific elements	23	10	8	1	2	1	1	34	15	12	4	3
Spot	18	7	7	1	1	1	1	24	11	5	5	3
Ephemeral	12	6	3		2	1		4	2	2		
Perceptual	20	11	3	3		2	1	16	11	1	4	
Expressive	20	12	2	2	3	1		10	8		1	1
Interpretative	12	1	8				3	20	5	7		8
Symbolic								7		1	5	1
Total	105	47	31	7	8	6	6	115	52	28	19	16

(**a**) (**b**)

Figure 8. (**a**) A representative photo of cluster "Water"; and (**b**) a representative photo of cluster "Rock/Tree".

(**a**) (**b**)

Figure 9. (**a**) A representative photo of cluster "Water"; and (**b**) a representative photo of cluster "Wildflower".

Table 10. Contents of nodes and its frequency of liked natural elements allocated to each of the main clusters in the novice group.

Cluster	**Specific Elements**	**Spot**	**Cognitive Process**			
			Perceptual	**Expressive**	**Interpretative**	**Symbolic**
Water	The water in the valley (7), Fish (2), Waterfall (1)	Unit B (4), Unit A (3)	Flowing through the rocks (4), Huge (3), Clean (2)	Refreshing (7), Active (2), Letting me be rest (1)	Seem to be designed (1)	
Rock/Tree	Rock in the valley (3), Moss (1), Rock on the trail (1)	Unit B (5), Unit D (1), Unit C (1)	Transparent (1), Coherent (1), Blocked the way (1)	Mystery (2)	Natural (4), Taking discomfort (2), not artificial (1)	

Table 11. Contents of nodes and its frequency of liked natural elements allocated to each of the main clusters in the veteran group.

Cluster	Specific Elements	Spot	Cognitive Process			
			Perceptual	Expressive	Interpretative	Symbolic
Water	The water in the valley (8), Deck roads (3), Fish (1)	Unit B (7), Unit A (2), Unit C (2)	Clean (3), Flowing through the rocks (4), Can be seen from close (3)	Refreshing (4), Active (2), Not boring (1)	Being well preserved (2), Convenient (3)	
Wild-flower	Wildflower (5), *Hemerocallis fulva* (2), *Lilium lancifolium* (1)	Unit C (3), Unit A (1), Unit B (1)	Standing out (1)		Similar (1), Being confusing (1), The vitality of nature (2)	A barren hill (1)

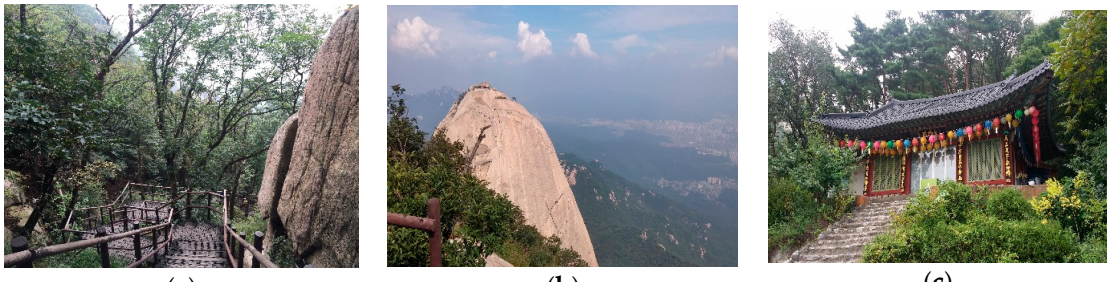
Cluster "rock/tree" in the novice group concerns specific elements such as rocks and trees (see Figure 8). It is interpreted as a high valuation for naturalness that is preserved without being damaged as much as possible. Cluster "wildflower" in the veteran group contains information on the management of wildflowers and of vegetation around the trail (see Figure 9, Tables 10 and 11).

Both groups' perceptions of natural elements indicate strong preferences for naturalness in relation to water. As suggested by Taylor et al. [52], the study result also indicates that water resources are one of the most strongly preferred natural elements. The difference is that the veteran group perceives that naturalness is high in the areas of restored vegetation as well as the wild flowers. Specifically, participants who remembered the area before and after its development mentioned the necessity of restoring them to the state of wild nature before development.

The number of photographed anthropic elements was almost twice as high in the veteran group (n = 49) as in the novice group (n = 26). The novice group preferred seven photographs compared with 19 in the veteran group. As with the number of pictures, the number of nodes and the veteran group (n = 96) were higher. In the total number of nodes in the veteran group, 36 nodes related to stewardship in the interpretative level.

The cluster was divided into five in the novice groups and eight in the veteran group. The most important perception of "liked" anthropic landscape elements are Deck roads (n = 10), Rock climbers (n = 9), and Temple (n = 8) in the novice group, and Guide signs (n = 32) and Visitors (n = 22) in the veteran group (see Figure 10, Tables 12 and A3).

Cluster "rock climbers" and "visitors" concern other visitors that participants might meet or see in the national park (see Figures 10 and 11). The content of "Rock climbers" represents positive responses at the expressive level concerning resting or climbing, such as serenity or novelty. Cluster "visitors" refers to visitors who are resting naturally, criticizing the presence of a large-scale shelter, and mentioning ways to remain longer in the forest through a small-scale shelter that does not (in the participants' perceptions) damage the environment around the trail (see Tables 13 and 14).



(**a**) (**b**) (**c**)

Figure 10. (**a**) A representative photo of cluster "Deck roads"; (**b**) a representative photo of cluster "Rock climbers"; and (**c**) a representative photo of cluster "Temple".

Table 12. Number of nodes of liked anthropic elements allocated to each of the landscape attributes and to the individual clusters distinguishing between two groups.

	The Novice Group						The Veteran Group								
	SUM	**Temple**	**Deck Roads**	**Rock Climbers**	**Guide Signs**	**Stone Stairs**	**SUM**	**Guide Signs**	**Remains**	**Facilities**	**Visitors**	**Plant Name Tag**	**Trails**	**Temple**	**Foreigner**
Specific elements	9	2	3	1	1	2	16	6	3	2	2	1	1	1	
Spot	7	1	2	2	1	1	19	4	3	2	4	3	1	1	1
Ephemeral	3	1		2			7		1		5				1
Perceptual	6	2	3	1			10		1	5	4				
Expressive	6	1		2			4		1		2				1
Interpretative	7	1	2		2	2	36	21	1	1	5	3	2	3	
Symbolic	1			1			4	1	2						1
Total	36	8	10	9	4	5	96	32	12	10	22	7	4	5	4

Table 13. Contents of nodes and its frequency of liked anthropic elements allocated to each of the main clusters in the novice group.

Cluster	**Specific Elements**	**Spot**	**Cognitive Process**			
			Perceptual	**Expressive**	**Interpretative**	**Symbolic**
Deck roads	Steep slope (1), Deck roads (1), A small hidden gate (1)	Unit C (1)	Can be seen from close (1), Spiral shape (1), Unique (1)	-	A part of the Wall (1), Historical remains (1)	-
Rock climbers	Insubong Peak (1), Rock climber (1), Visitors (1)	Unit D (2)	Taking a rest (1)	Curious (1), Thrilled (1)	-	As a picture (1)
Temple	Temple (1), Lotus lantern (1)	Unit B (1)	Coherent (1)	Safe (1)	Representative resources (1)	-

(**a**) (**b**)

Figure 11. (**a**) A representative photo of cluster "Guide signs"; and (**b**) a representative photo of cluster "Visitors".

Table 14. Contents of nodes and its frequency of liked anthropic elements allocated to each of the main clusters in the veteran group.

Cluster	Specific Elements	Spot	Cognitive Process			
			Perceptual	Expressive	Interpretative	Symbolic
Guide signs	Guide signs (6)	Unit A (4)	-	-	Providing information (5), Useful (4), Explanation of the gate (3)	Preparing (1)
Visitors	Visitors (5) In the forest (1), A spacious rock (1)	Unit D (2), Unit B (1), Unit C (1)	Taking a rest (4)	Serene (2)	Being used as a shelters (2), No need shelter (1), Small shelters (1)	-

Cluster "guide signs" contains a positive note on the guide signage that provides a variety of information in the national park (see Figure 11). Respondents perceive that the quality of the signboards and the types of information provided, such as history, animals, and plants, are being managed well (see Table 14).

The number of disliked photos that contain anthropic elements was also higher in the veteran group (n = 30) than in the novice group (n = 19). Node extraction shows that disliked photos were associated with many more nodes than the "liked" photos among the veteran (n = 174) and novice (n = 111) groups.

Six clusters were identified in the novice group, and five in the veteran group. Facilities (n = 29) and Bridges (n = 27) in the novice group, and Remains (n = 58), Facilities (n = 44), and Shelters (n = 41) in the veteran group are the most important clusters for negative perception of anthropic elements (see Tables 15 and A4).

Cluster "facilities" of the novice group concerns the wires and electric poles that can be seen in the forest, and anthropic structures whose functions are unknown (see Figure 12). The structures with unknown uses are evidence of poor management, and suggest that they should be dismantled. "Bridges" concerns materials such as concrete or marble, which are inappropriate for the natural environment (see Figure 12, Table 16).

Cluster "remains" concerns the history of the national park. In addition to walls built during the Joseon Dynasty 500 years ago, it includes opinions on various historical layers, including traces of villages constructed up to the 20th century. Cluster "facilities" of the veteran group concerns negative perception of facilities installed to improve walkability and accessibility. Cluster "shelters" refers to improvements in the scale, facilities to be installed, and surrounding conditions in relation to the shelter constructed on the trail (see Figure 13, Table 17).

Table 15. Contents of nodes and its frequency of disliked anthropic elements allocated to each of the main clusters in the novice group.

	The Novice Group							The Veteran Group					
	SUM	**Buildings**	**Bridges**	**Facilities**	**Deck Roads**	**Fences**	**Remains**	**SUM**	**Remains**	**Shelters**	**Facilities**	**Vending Machines**	**Stone Stairs**
Specific elements	29	5	3	12	7	1	1	39	3	10	12	2	6
Spot	19	5	3	4	5	1	1	30	10	6	8	2	4
Ephemeral	7	4	2	1	-	-	-	1		1		-	-
Perceptual	17	6	7	3	1	-	-	12		9	2	1	-
Expressive	13	1	2	4	4	1	1	6		1	4	-	1
Interpretative	26	-	10	5	3	4	4	84	39	14	16	3	12
Symbolic	-	-	-	-	-	-	-	2			2	-	-
Total	111	21	27	29	20	7	7	174	58	41	44	8	23

(**a**) (**b**)

Figure 12. (**a**) A representative photo of cluster "Facilities"; and (**b**) a representative photo of cluster "Bridges".

Table 16. Contents of nodes and its frequency of disliked anthropic elements allocated to each of the main clusters in the novice group.

Cluster	Specific Elements	Spot	Cognitive Process			
			Perceptual	Expressive	Interpretative	Symbolic
Facilities	In the forest (6) Wires and electric poles (3), Structures (2)	Unit B (3), Unit A (1)	Be overgrown (1), Get tangled (1), Blocked the view (1)	Ugly (2), Expectation (1), Scared (1),	Not knowing the purpose (2), Seem to be neglected (1), Need to be removed (1)	-
Bridges	Bridge (2), Temple (1)	Unit C (2), Unit B (1)	Incoherent (7)	Repulsed (2)	Artificial (3), Made of concrete (2), Made of marble (2)	-

(**a**) (**b**) (**c**)

Figure 13. (**a**) A representative photo of cluster "Remains"; (**b**) a representative photo of cluster "Facilities"; and (**c**) a representative photo of cluster "Shelters".

The novice group positively perceived the artificial elements that enhance convenience. On the other hand, the veteran group prefers the appearance of visitors who are resting naturally, as well as providing more information about the national park, such as guide signs that provide diverse information.

The number of nodes related disliked anthropic elements occupies the largest number of nodes in the level of interpretative. In particular, the number of nodes is much higher in the veteran group. The novice group focuses on the complexity one of the visual landscape characters in the natural environment, while the veteran group mentions opinions or thoughts about conflicting values such as historicity, naturalness, and affordance.

Table 17. Contents of nodes and its frequency of disliked anthropic elements allocated to each of the main clusters in the veteran group.

Cluster	Specific Elements	Spot	Cognitive Process			
			Perceptual	Expressive	Interpretative	Symbolic
Remains	Information center (2), Guide signs (2), Fortress (3)	Unit A (6), Unit C (4)	-	-	Seem to be neglected (6), Restore (4), Need to be removed (3)	-
Facilities	Guardrail (3), In the forest (2), Wires and electric poles (2)	Unit C (5), Unit D (2), Unit A (1)	Collapsed (1), Get tangled (1)	Dangerous (3), Unpleasant (1)	Damaging (5), Made of steel (3), Convenience (2)	Putting a distance (2)
Shelters	Shelters (4), Bridge (3), Boundary stones (1)	Unit C (4), Unit A (1), Unit B (1)	Incoherent (5), Standing out (3), Enclosed (1)	Stuffy (1)	Under-utilization (3), The material of facilities (3), Artificial (2)	-

3.4. Utilization of Commonality and Diversity of Perception in Landscape Management

The differences in the perceptions of two groups were remarkable in the interpretative level during the cognitive process. The contents of major nodes appearing in the interpretative level are related to the human impacts such as naturalness, stewardship, disturbance of landscape character concepts. This level emphasizes narrative functions of landscape, and the contents of accepting and interpreting landscape phenomena may vary depending on an individual's interest and background. It is therefore necessary to acknowledge that the underlying values and assigned values are different and to understand the role of the two values [53]. In practice, the decision-making process for management of protected areas such as national parks should include not only ecological data but also human, social and economic data [54].

The photo-logs showed more nodes related to the interpretative level among the veteran group than the novice group, especially for anthropic elements. The veteran group showed a strong tendency to interpret landscape from a relatively critical perspective. This result is similar to the findings of local residents perceiving rural landscapes [31], which contain critical but constructive opinions. The greater the participants' experience of the national park, the closer were their perception to those of the local residents who have the higher affinity to the rural landscapes.

According to "cues to care" or "the theory of visible stewardship", humans generally have a higher preference when there are signs that the given environment is visibly and carefully managed [55,56]. On the one hand, it is argued that when considering the installation of artificial elements, efforts should be made to minimize the visual impact and maximize the use of natural materials [20]. However, the cue of care cannot be stereotyped because it can vary in cultural context [55]. This approach to formal management can easily achieve consensus if the quality of the landscape is extremely good or bad [4]. As shown in this study, both groups expressed negative perceptions of the bridges constructed of marble. However, in the case of anthropic elements, there were few cases in which visible problems were clearly noticed. Rather, they were difficult to find without paying close attention. In addition, preference for anthropic elements may vary depending on the importance of values. The cue of care has a halo effect that allows people to take responsibility for providing care [55]. If such a halo effect becomes a cultural norm, its power can become even bigger [57].

In the case of the novice group, they had positive perception of anthropic facilities that enhanced walkability and accessibility [32]. In contrast, the veteran group considered nature foremost, and had negative opinions of artificial facilities that damaged their perception of naturalness. For example, they did not prefer large shelters, and were opposed to what they regarded as excessive measures to promote accessibility, which they considered as undermining the natural environment.

There was no significant difference between the two groups regarding the interpretative level of the natural elements. The participants mostly focused on the structures and diversity of vegetation, and on individual plants or animals [58]. Consequently, the novice group did not mention the vegetation and its structure, and positively recognized individual natural elements such as water, trees, and rocks. The veteran groups made greater references to wildflowers, but also provided information on the need for management of vegetation diversity and information for ecological education. Providing information on biodiversity and management in ecological terms is closely related to landscape preferences [30]. Because both groups were ordinary people, perception of naturalness appeared through expressive response rather than interpretative one.

Despite the general limitations of qualitative studies that are not easy to generalize in this study, it is a very useful way to analyze the differences of perceptions of two visitors, both the novice group and the veteran group in order to grasp the positive or negative perceptions of people's impacts on the landscape. Understanding the value of relevant visitors through analysis results is one way to resolve potential conflicts [53].

4. Conclusions

This study used VEP to analyze differing perceptions of landscape among two groups according to their familiarity with and experiences of the national park. As a result, the novice group showed relatively more response in perceptual and expressive level, and the veteran group in interpretative and symbolic level. Perceptual and expressive level are related to visual scale, coherence, and complexity, and interpretative and symbolic level are about naturalness, disturbance, stewardship, historicity and imageability.

The visual scale of landscape character can be useful for managing a series of experiences of landscape. Landscape experiences is most influenced by the visual scale. The novice group responded more sensitively to the perceptual and expressive level than the veteran group. Based on the knowledge of the novice group, it is possible to manage the main viewpoints that can be seen beautiful scenic view, and experience-based landscape management to consider feelings of the safety and tranquility in the forest.

The response of the interpretative level to the artificial elements of the veteran group was more prominent than that of the novice group. The main content is about the stewardship of the landscape characters. The higher is the familiarity of the national park, the stronger is the critical view of artificial facilities. The process of accumulating cues of careful care through coordination among various stakeholders with a high level of attachment is important. The perception of landscape of highly experienced group can be used as the main data in this process.

Understanding perceptions of landscape is important for its sustainable management. In particular, it is necessary to consider both commonality and diversity of landscape perception: commonalities provide clues towards the consensus on the value of the landscape qualities, whereas diverse opinions help to identify values that are often overlooked. This study attempts to qualitatively grasp landscape perceptions. Although the number of participants is limited, the method presented here is expected to be applied in future research into perception of landscape.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Number of nodes related spatial configurations (liked) allocated to each of the seven attributes and to the individual categories distinguishing among four and four clusters.

Label	Category	The Novice Group					The Veteran Group				
		SUM	**Terrain**	**Insubong Peak**	**Forest**	**Mankyoungdae Peak**	**SUM**	**Terrain**	**Peaks**	**Forest**	**Bedrock Space**
Spatial configurations	Topology	29	23	4	-	2	28	14	14		
	Space	10	-	-	10	-	6			4	2
	Elements	2	-	-	2	-					
	Other	2	2				1	1			
SUM		43	25	4	12	2	35	15	14	4	2
Spot	Unit A	9	9	-	-	-	5	3	1	1	
	Unit B	6	-	-	6	-	3	2		1	
	Unit C	4	2		2	-	5		1	2	2
	Unit D	10		8		2	16	9	7		
SUM		29	11	8	8	2	29	14	9	4	2
Ephemeral	Light/Weather	4	3		1		1				1
	People	2		2			1		1		
	Sensory	8	7	1			2			2	
	Water	3			3		2				2
SUM		17	10	3	4		6		1	2	3
Perceptual	Depth of view	12	9		3		2			2	
	Breadth of view	13	12		1		3		3		
	Vividness	15	8	5		2	10	6	4		
	Complexity	5	5				1	1			
	Other	1			1		2	1	1		
SUM		46	34	5	5	2	18	8	8	2	
Expressive	Tranquil	5			5		4			4	
	Relieved	8	2		6		5		2	1	2
	Wonderness	5		5			7	7			
	Mystery	5	4	1			3	2	1		
	Other	5	3	2			2	2			
SUM		28	9	8	11		21	11	3	5	2
Interpretative	Naturalness	6	3		3		3	3			
	Stewardship	2			2		7	1	2	2	2
SUM		8	3		5		10	4	2	2	2
Symbolic	Imagination	3		2	1		1			1	
	Memory						16	3	13		
SUM		3		2	1		17	3	13	1	
Total		174	92	30	46	6	136	55	50	20	11

Table A2. Number of nodes related natural elements (liked) allocated to each of the seven attributes and to the individual categories distinguishing among five and four clusters.

Label	Category	The Novice Group							The Veteran Group				
		SUM	Water	Rock/Tree	Bedrock	Wildflower	Pine Tree	Vegetation	SUM	Water	Wildflower	Rocks	Vegetation
Specific elements	Water	8	8	-	-				10	10			
	Rocks/Trees	10		7	1	1	1		7		2	4	1
	Vegetation	2				1		1	12		10		2
	Other	3	2	1					5	5			
SUM		23	10	8	1	2	1	1	34	15	12	4	3
Spot	Unit A	4	3		1				5	2	1		2
	Unit B	11	4	5		1		1	8	7	1		
	Unit C	2		1			1		6	2	3		1
	Unit D	1		1					5			5	
SUM		18	7	7	1	1	1	1	24	11	5	5	3
Ephemeral	Light/Weather	3		2		1							
	Sensory	9	6	1		1	1		4	2	2		
SUM		12	6	3		2	1		4	2	2		
Perceptual	Vividness	9	5	1	2		1		7	3	1	3	
	Static	6	2	1	1		1	1	4	4			
	Dynamic	4	4						4	4			
	Complexity	1		1					1			1	
SUM		20	11	3	3		2	1	16	11	1	4	
Expressive	Tranquil	3				3							
	Relieved	9	9						4	4			
	Wonderness	1	1										
	Mystery	4		2	2				1			1	
	Active	3	2				1		4	4			
	Other								1				1
SUM		20	12	2	2	3	1		10	8		1	1
Interpretative	Naturalness	10	1	6				3	7	2	2		3
	Stewardship	2		2					11	3	4		4
	Historicity								2		1		1
SUM		12	1	8				3	20	5	7		8
Symbolic	Imagination								4			4	
	Memory								3		1	1	1
SUM									7		1	5	1
Total		105	47	31	7	8	6	6	115	52	28	19	16

Table A3. Number of nodes related anthropic elements (liked) allocated to each of the seven attributes and to the individual categories distinguishing among five and eight clusters.

Label	Category	The Novice Group						The Veteran Group								
		SUM	Temple	Deck Roads	Rock Climber	Guide Signs	Stone Stairs	SUM	Guide Signs	Remains	Facilities	Visitors	Plant Name Tag	Trails	Temple	Foreigner
Specific elements	Facilities	3		1		1	1	11	6	2	2		1			
	Temple	1	1					1							1	
	Remains	1		1				1		1						
	Natural	3		1	1		1	3				2		1		
	Other	1	1													
SUM		9	2	3	1	1	2	16	6	3	2	2	1	1	1	
Spot	Unit A							8	4				3	1		
	Unit B	1	1					3			2	1				
	Unit C	4		2		1	1	6		3		1			1	1
	Unit D	2			2			2				2				
SUM		7	1	2	2	1	1	19	4	3	2	4	3	1	1	1
Ephemeral	Light/Weather							1	1							
	People	2			2			6				5				1
	Sensory	1	1													
	Water															
SUM		3	1		2			7	1			5				1
Perceptual	Vividness	1		1				1		1						
	Static	2		2								4				
	Dynamic	1			1			4			4					
	Complexity	2	2					4			1					
	Other							1								
SUM		6	2	3	1			10		1	5	4				
Expressive	Tranquil							2				2				
	Relieved	1	1													
	Wonderness															
	Mystery	1			1											
	Active	1			1											
	Other							2		1						1
SUM		3	1		2			4								
Interpretative	Naturalness	1					1									
	Stewardship	4	1			2	1	34	20		1	5	3	2	3	
	Historicity	2		2				2	1	1						
SUM		7	1	2		2	2	36	21	1	1	5	3	2	3	
Symbolic	Imagination	1			1											
	Memory															
	Idea							3	1	2						
	Phenomena							1								
SUM		1						4								1
Total		36	8	10	9	4	5	96	32	12	10	22	7	4	5	4

Table A4. Number of nodes related anthropic elements (disliked) allocated to each of the seven attributes and to the individual categories distinguishing among six and five clusters.

Label	Category	The Novice Group							The Veteran Group					
		SUM	Buildings	Bridges	Facilities	Deck Roads	Fences	Remains	SUM	Remains	Shelters	Facilities	Vending Machines	Stone Stairs
Specific elements	Facilities	11	2	2	3	3	1		24	2	9	8	2	3
	Temple	4	3	1					1		1			
	Remains	3			2			1	7	7				
	Natural	11			7	4			6			3		3
	Other								1			1		
SUM		29	5	3	12	7	1	1	39	9	10	12	2	6
Spot	Unit A	7	5		1			1	10	6	1	1	2	
	Unit B	4		1	3				2		1			1
	Unit C	7		2		4	1		16	4	4	5		3
	Unit D	1				1			2			2		
SUM		19	5	3	4	5	1	1	30	10	6	8	2	4
Ephemeral	Sensory	7	4	2	1				1		1			
SUM		7	4	2	1				1		1			
Perceptual	Vividness	1	1						3		3			
	Static	4	1		3				3		1	2		
	Dynamic								1				1	
	Complexity	12	4	7		1			5		5			
SUM		17	6	7	3	1			12		9	2	1	
Expressive	Safety	6	1		1	4			3			3		
	Unpleasant	5		2	2		1		1			1		
	Bored								2		1			1
	Other	2			1			1						
SUM		13	1	2	4	4	1	1	6		1	4		1
Interpretative	Naturalness	4		3		1			5	1				4
	Stewardship	6			2	2		2	39	15	8	6	3	7
	Historicity	1						1	17	17				
	Disturbance	15		7	3		4	1	23	6	6	10		1
SUM		26		10	5	3	4	4	84	39	14	16	3	12
Symbolic	Imagination								2			2		
SUM									2			2		
Total		111	21	27	29	20	7	7	174	58	41	44	8	23

References

1. Daniel, T.C. Whither scenic beauty? Visual landscape quality assessment in the 21st century. *Landsc. Urban Plan.* **2001**, *54*, 267–281. [CrossRef]
2. Kalivoda, O.; Vojar, J.; Skrivanova, Z.; Zahradnik, D. Consensus in landscape preference judgments: The effects of landscape visual aesthetic quality and respondents' characteristics. *J. Environ. Manag.* **2014**, *137*, 36–44. [CrossRef]
3. Ueda, H.; Nakajima, T.; Takayama, N.; Petrova, E.; Matsushima, H.; Furuya, K.; Aoki, Y. Landscape image sketches of forests in Japan and Russia. *For. Policy Econ.* **2012**, *19*, 20–30. [CrossRef]
4. Wang, R.; Zhao, J.; Liu, Z. Consensus in visual preferences: The effects of aesthetic quality and landscape types. *Urban For. Urban Green.* **2016**, *20*, 210–217. [CrossRef]
5. Arriaza, M.; Cañas-Ortega, J.F.; Cañas-Madueño, J.A.; Ruiz-Avile, P. Assessing the visual quality of rural landscapes. *Landsc. Urban Plan.* **2004**, *69*, 115–125. [CrossRef]
6. Ode Sang, Å.; Tveit, M.S.; Fry, G. Advantages of using different data sources in assessment of landscape change and its effect on visual scale. *Ecol. Indic.* **2010**, *10*, 24–31. [CrossRef]
7. Schirpke, U.; Tasser, E.; Tappeiner, U. Predicting scenic beauty of mountain regions. *Landsc. Urban Plan.* **2013**, *111*, 1–12. [CrossRef]
8. Scott, A. Assessing Public Perception of Landscape: From Practice to Policy. *J. Environ. Policy Plan.* **2003**, *5*, 123–144. [CrossRef]
9. Arthur, L.M.; Daniel, T.C.; Boster, R.S. Scenic assessment: An overview. *Landsc. Plan.* **1977**, *4*, 109–129. [CrossRef]
10. Daniel, T.C.; Boster, R.S. *Measuring Landscape Esthetics: The Scenic Beauty Estimation Method; USDA Forest Service Research Paper RM-167*; U.S. Department of Agriculture: Washington, DC, USA, 1976. Available online: https://www.fs.fed.us/rm/pubs_rm/rm_rp167.pdf (accessed on 17 July 2017).
11. Daniel, T.C.; Meitner, M.M. Representational Validity of Landscape Visualizations: The Effects of Graphical Realism on Perceived Scenic Beauty of Forest Vistas. *J. Environ. Psychol.* **2001**, *21*, 61–72. [CrossRef]
12. Dupont, L.; Antrop, M.; Van Eetvelde, V. Eye-tracking analysis in landscape perception research: Influence of photograph properties and landscape characteristics. *Landsc. Res.* **2014**, *39*, 417–432. [CrossRef]
13. Hull, R.B., IV; Stewart, W.P. Validity of photo-based scenic beauty judgments. *J. Environ. Psychol.* **1992**, *12*, 101–114. [CrossRef]
14. Svobodova, K.; Sklenicka, P.; Molnarova, K.; Vojar, J. Does the composition of landscape photographs affect visual preferences? The rule of the Golden Section and the position of the horizon. *J. Environ. Psychol.* **2014**, *38*, 143–152. [CrossRef]
15. Hoyle, H.; Hitchmough, J.; Jorgensen, A. All about the "wow factor"? The relationships between aesthetics, restorative effect and perceived biodiversity in designed urban planting. *Landsc. Urban Plan.* **2017**, *164*, 109–123. [CrossRef]
16. Martens, D.; Gutscher, H.; Bauer, N. Walking in "wild" and "tended" urban forests: The impact on psychological well-being. *J. Environ. Psychol.* **2011**, *31*, 36–44. [CrossRef]
17. Scott, A.; Carter, C.; Brown, K.; White, V. "Seeing is Not Everything": Exploring the Landscape Experiences of Different Publics. *Landsc. Res.* **2009**, *34*, 397–424. [CrossRef]
18. Stewart, W.P.; Hull, R.B., IV. Satisfaction of what? Post hoc versus real-time construct validity. *Leis. Sci.* **1992**, *14*, 195–209. [CrossRef]
19. Kaplan, R.; Kaplan, S. *The Experience of Nature: A Psychological Perspective*; Cambridge University Press: Cambridge, UK, 1989.
20. Nielsen, A.B.; Heyman, E.; Richnau, G. Liked, disliked and unseen forest attributes: Relation to modes of viewing and cognitive constructs. *J. Environ. Manag.* **2012**, *113*, 456–466. [CrossRef] [PubMed]
21. Carlson, A.A. On the possibility of quantifying scenic beauty. *Landsc. Plan.* **1977**, *4*, 131–172. [CrossRef]
22. Nohl, W. Sustainable landscape use and aesthetic perception-preliminary reflections on future landscape aesthetics. *Landsc. Urban Plan.* **2001**, *54*, 223–237. [CrossRef]
23. Tveit, M.S.; Ode Sang, Å.; Fry, G. Key concepts in a framework for analysing visual landscape character. *Landsc. Res.* **2006**, *31*, 229–255. [CrossRef]
24. Lothian, A. Landscape and the philosophy of aesthetics: Is landscape quality inherent in the landscape or in the eye of the beholder? *Landsc. Urban Plan.* **1999**, *44*, 177–198. [CrossRef]

25. Martín, B.; Ortega, E.; Otero, I.; Arce, R.M. Landscape character assessment with GIS using map-based indicators and photographs in the relationship between landscape and roads. *J. Environ. Manag.* **2016**, *180*, 324–334. [CrossRef] [PubMed]
26. Arnberger, A.; Eder, R.; Allex, B.; Sterl, P.; Burns, R.C. Relationships between national-park affinity and attitudes towards protected area management of visitors to the Gesaeuse National Park, Austria. *For. Policy Econ.* **2012**, *19*, 48–55. [CrossRef]
27. Beza, B.B. The aesthetic value of a mountain landscape: A study of the Mt. *Everest Trek. Landsc. Urban Plan.* **2010**, *97*, 306–317. [CrossRef]
28. Daerden, P. Factors influencing landscape preferences: An emprical investigation. *Landsc. Plan.* **1984**, *11*, 293–306. [CrossRef]
29. Dobbie, M.F. Public aesthetic preferences to inform sustainable wetland management in Victoria, Australia. *Landsc. Urban Plan.* **2013**, *120*, 178–189. [CrossRef]
30. Van der Wal, R.; Miller, D.; Irvine, J.; Fiorini, S.; Amar, A.; Yearley, S.; Gill, R.; Dandy, N. The influence of information provision on people's landscape preferences: A case study on understorey vegetation of deer-browsed woodlands. *Landsc. Urban Plan.* **2014**, *124*, 129–139. [CrossRef]
31. Prestholdt, R.; Nordbø, I. Norwegian landscapes: An assessment of the aesthetical visual dimensions of some rural destinations in Norway. *Scand. J. Hosp. Tour.* **2015**, *15*, 202–222. [CrossRef]
32. Ode Sang, Å.; Tveit, M.S.; Fry, G. Capturing Landscape Visual Character Using Indicators: Touching Base with Landscape Aesthetic Theory. *Landsc. Res.* **2008**, *33*, 89–117. [CrossRef]
33. Juffe-Bignoli, D.; Burgess, N.D.; Bingham, H.; Belle, E.M.S.; De Lima, M.G.; Deguignet, M.; Bertzky, B.; Milam, A.N.; Martinez-Lopez, J.; Lewis, E.; et al. *Protected Planet Report 2014*; United Nations Environment Programme: Cambridge, UK, 2014; Available online: http://s3.amazonaws.com/academia.edu.documents/38647349/Protected_Planet_Report_2014_01122014_EN_web.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1500945452&Signature=xWcnLV%2BWI8BnzH%2B129eYSVZLHx8%3D&response-content-disposition=inline%3B%20filename%3DProtected_Planet_Report_2014.pdf (accessed on 17 July 2017).
34. Korea National Park Service (KNPS). Available online: http://english.knps.or.kr/ScienPds/Content.aspx?SEQUEN=43&MenuNum=4&Submenu=ScienPds (accessed on 17 July 2017).
35. Jacobsen, J.K.S. Use of landscape perception methods in tourism studies: A review of photo-based research approaches. *Tour. Geogr.* **2007**, *9*, 234–253. [CrossRef]
36. Cherem, G.J.; Driver, B.L. Visitor employed photography: A technique to measure common perceptions of natural environments. *J. Leis. Res.* **1983**, *15*, 65–83.
37. Garrod, B. Understanding the relationship between tourism destination imagery and tourist photography. *J. Travel Res.* **2008**, *47*, 1–13. [CrossRef]
38. Lin, H.-N.; Morgan, M.; Coble, T. Remember the Alamo: A Cross-Cultural Analysis of Visitor Meanings. *J. Travel Res.* **2013**, *52*, 42–55. [CrossRef]
39. Oku, H.; Fukamachi, K. The differences in scenic perception of forest visitors through their attributes and recreational activity. *Landsc. Urban Plan.* **2006**, *75*, 34–42. [CrossRef]
40. Stedman, R.; Beckley, T.; Wallace, S.; Armbard, M. A picture and 1000 words: Using resident-employed photography to understand attachment to high amenity places. *J. Leis. Res.* **2004**, *36*, 580–606.
41. Yamashita, S. Perception and evaluation of water in landscape: Use of Photo-Projective Method to compare child and adult residents' perceptions of a Japanese river environment. *Landsc. Urban Plan.* **2002**, *62*, 3–17. [CrossRef]
42. Dorwart, C.E.; Moore, R.L.; Leung, Y.-F. Visitors' perceptions of a trail environment and effects on experiences: A model for nature-based recreation experiences. *Leis. Sci.* **2010**, *32*, 33–54. [CrossRef]
43. Tahvanainen, L.; Tyrväinen, L.; Ihalainen, M.; Vuorela, N.; Kolehmainen, O. Forest management and public perceptions—Visual versus verbal information. *Landsc. Urban Plan.* **2001**, *53*, 53–70. [CrossRef]
44. Bieling, C.; Plieninger, T.; Pirker, H.; Vogl, C.R. Linkages between landscapes and human well-being: An empirical exploration with short interviews. *Ecol. Econ.* **2014**, *105*, 19–30. [CrossRef]
45. Shim, J.-M. Freelisting: A new research method. *J. Tour. Sci.* **2011**, *35*, 33–51.
46. Van Atteveldt, W. *Semantic Network Analysis: Techniques for Extracting, Representing, and Querying Media Content*; BookSurge Publishers: Charleston, SC, USA, 2008.

47. Lee, D.; Lee, H. Understanding the semantic network structure in the consumer group interview with the subnetwork analysis. *Korean Soc. Consum. Stud.* **2012**, *23*, 249–272.
48. Paranyushkin, D. *Identifying the Pathways for Meaning Circulation Using Text Network Analysis*; Nodus Labs: Berlin, Germany, 2011.
49. Park, C.-S.; Chung, C.-W. Text network analysis: Analysing socio-cognitive network of stakeholders' shared meanings. *J. Gov. Stud.* **2013**, *19*, 73–108.
50. Callon, M.; Courtial, J.-P.; Turner, W.A.; Bauin, S. From translations to problematic networks: An introduction to co-word analysis. *Colloq. Sociol. Anal. Sci. Tech. Res.* **1983**, *22*, 191–235. [CrossRef]
51. Freeman, L.C. Centrality in Social Networks. *Soc. Netw.* **1978**, *1*, 215–239. [CrossRef]
52. Taylor, J.G.; Czarnowski, K.J.; Sexton, N.R.; Flick, S. The importance of water to Rocky Mountain National Park visitors: An adaptation of visitor-employed photography to natural resources management. *J. Appl. Recreat. Res.* **1995**, *20*, 61–85.
53. Ives, C.D.; Kendal, D. The role of social values in the management of ecological systems. *J. Environ. Manag.* **2014**, *144*, 67–72. [CrossRef] [PubMed]
54. Knight, A.T.; Sarkar, S.; Smith, R.J.; Strange, N.; Wilson, K.A. Engage the hodgepodge: Management factors are essential when prioritizing areas for restoration and conservation action. *Divers. Distrib.* **2011**, *17*, 1234–1238. [CrossRef]
55. Nassauer, J.I. Care and stewardship: From home to planet. *Landsc. Urban Plan.* **2011**, *100*, 321–323. [CrossRef]
56. Sheppard, S.R.J. Beyond visual resource management: Emerging theories of an ecological aesthetic and visible stewardship. In *Forests and Landscapes: Linking Ecology, Sustainability and Aesthetics*, 1st ed.; Sheppard, S.R.J., Harshaw, H.W., Eds.; CABI: Wallingford, UK, 2001; pp. 149–172. [CrossRef]
57. Nassauer, J.I.; Wang, Z.; Dayrell, E. What will the neighbors think? Cultural norms and ecological design. *Landsc. Urban Plan.* **2009**, *92*, 282–292. [CrossRef]
58. Qiu, L.; Lindberg, S.; Nielsen, A.B. Is biodiversity attractive?—On-site perception of recreational and biodiversity values in urban green space. *Landsc. Urban Plan.* **2013**, *119*, 136–146. [CrossRef]