

Cognitive processes of the environmental perception: a methodological approach to the semantic aesthetics of open-air archaeological contexts

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Abstract. The article presents an on-going methodological framework for understanding aesthetic experience, with specific reference to the semantic semiotics of the natural landscape and open-air archaeological contexts. The approach involves two broad perspectives: First, a socio-psychological which refers to the “aesthetic enjoyment” (a kind of pleasure) of the cultural visitors and which is approached from the point of view of socio-cultural experiences that are revived aesthetically and secondly, a structural – functional approach concerning the mechanisms which activate the cognitive processes of the environmental perception. The aim of this research is to ascertain the semiotic processes by examining the naturalized and phenomenological dimensions of the environmental space which are activated in the simple viewing of open-air antiquities.

1 Introduction

The present research is part of a dual scientific approach (socio-psychological and structural-functional) to outdoor antiquities and the (open) space environment as a cognitive phenomenon in visitors perception capable of shaping the perceived information of the landscape through semantic messages and meanings [1].

This new line of research in the applied interdisciplinary approach is to take a further step and describe the interaction of the physical environment with the "plasticity" of the aesthetic psychology of cultural tourism [2]. The approach focuses on the various attitudes of public responses to environmental parameters (ecological conditions) and the material-technical infrastructure and architectural elements of the archaeological sites [3].

The study is based on a strong limitation of this field of research, namely on the need to investigate the role that the perception of the external environment [4] plays in the (open) archaeological site, not only for its proper promotion and enhancement but mainly for the "aesthetic enjoyment" of a sustainable cultural experience [5].

This research has important theoretical and empirical implications not only for the cultural strategy of (cultural) specialists (who are active and work for its promotion) but mainly for the visitors, those who actually come into daily contact with them through each visit [3].

In particular, on an empirical level and in terms of the cultural psychology [6], of the visiting public the development and enhancement of a new “aesthetic

enjoyment” of the archaeological landscape [7, 8] cannot ignore the perception of the environment itself by those who visit open-air archaeological sites. Therefore, the promotion and enhancement of a heightened sensitivity (in terms of activating symbolic understanding) towards the archaeological landscape and its semantic signs [9] also has an important impact on the development of sustainable cultural tourism [10].

The aim of this research was to investigate the visitor’s perception of the archaeological site and botanic garden of Mon Repos in Corfu (Greece) [11, 12] and the relation formed through the semiotic processes as they are phenomenologically developed during the wandering in the natural - botanical landscape of the archaeological site. In this sense, phenomenological (external) space constitutes a perceptual constitution that is meaningful precisely because it is constituted under the perspective of temporality and realization [13].

Furthermore, this study aimed to verify the existing correlation between the perception of the botanical environment and the participation - engagement (of the visitor) with the broad natural landscape, assuming that high identification with it corresponds to higher aesthetic enjoyment and greater familiarity-appreciation with the archaeological information of the archaeological landscape.

2 Environmental perception and landscape

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The landscape, which is the result of an unceasing interaction between human activities and the spontaneous evolution of the natural environment, is not only permeated by the traces of historical stratification, but constitutes an important economic, ecological, and social resource, involving a great diversity of phenomena, configurations, qualities, and values of the entire territory. The perceptual analysis proceeds by classifying the identified data, which are considered either 'unchanging' or permanent points or changing elements of the environment and which are included in any plan to transform or modify the site by introducing new (additional) data (variables).

Information's about places are organised into environmental patterns; these are knowledge structures based on previous experiences, i.e., prior knowledge [14]. Such structures exist at different levels of abstraction and vary in their conceptual complexity. They are detected in environmental schemas which have an internal information structure. Environmental schemas are formed through a process of generalization and discrimination. People come into contact with different environments and gradually begin to categorize them according to the type of information they contain. The more familiar one becomes with a material "datum", the better knows it; therefore, a thorough familiarity is equivalent to solid knowledge.

2.1 Landscape perception and environmental psychology

Although in the classical psychological literature perception and cognition are considered two separate things, in the field of environmental psychology [15], argues that by the time a subject perceives a certain environment, has already cognitively processed the perceptual data coming from the different elements present in the environment and has structured them cognitively [16]. In particular it is observed that the visual perception of the landscape is a model of perception - as such, it is certainly subjective - which nevertheless lends itself to a certain degree of objectification, as it offers an analytical method for recognizing in the visible aspects and features of the territory meanings shared by a community of interpreters. In this sense, the epistemological model of the visual perception of the landscape appears to be suitable for use in a reconnaissance function by a subject who can be identified as an external user of the landscape. The mechanisms underlying the character of the landscape are both physical and mental, as they are partly based on the mindset of the individual; the same landscape can thus evoke different meanings in different people and at different times [17].

2.2 Environmental perception and aesthetics

Environmental perception is given by a set-structure of sensory information that is not specific to one sensory channel but instead originates from several channels; this

information complements and complements each other. The integration and completion of sensory information is a phenomenon that occurs during the first contact with an environment, the contact on which the subject structure knowledge about the environment.

3 Environmental semiotics and open-air archaeological sites

During a visit to an archaeological site, the visual significance of the forms and especially the form of the overall surrounding landscape influences the visibility and visual attractiveness of the archaeological structures [3]. Many elements of the natural landscape combined with the architectural remains of the ruins facilitate direct identification, through strong structured visual patterns, or images of the environment. There are visual qualities in certain landscape features that make them inevitably visible to the objective attention of the visitor-walker, through a general and sometimes selective viewing [18].

3.1 Environmental Design and Semiotics

The environmental design especially in areas with historical and archaeological interest is combined with many aspects. In this process the observation, perception of the local environment can be organized and shaped in order to be presented and perceived by visitors. This prospect is explained by the determination of humans to give prominence and meaning in their environment through signs. Moreover, the ongoing process is closely related with the cultural background but also with the degree of involvement in design processes. During design processes the semantic theory is providing the scientific background interpreting the places through their visual aspects including their functional as also as the spiritual point of view [32].

3.2 Landscape Semiotics

The discipline that studies landscape perception is landscape semiotics: it seems to focus essentially on the visual perception of landscape [17]. Semiotics is a field that emerged in the late nineteenth century, with theorists Charles Sanders Peirce and Ferdinand de Saussure. The semiotic construction makes (re)designs the objects surrounding the space. This means that semiotic processes not only permanently redesign our concepts, but also, and simultaneously, redesign the surrounding matter at the same time. It also includes lower (non-symbolic) levels of signs, those that are more exclusively indicative (based on physical or causal connections) or iconic (based on similarity), of which we are not directly aware, since they operate at the non-conscious levels of the mental system and action [19]. Charles Morris (1938) explicitly stressed the need to theorize the relationship between signs and values, and in fact oriented much of his own research in this direction [20]. However, formal semiotics has largely

emerged as a predominantly cognitive science, a descriptive science with claims of neutrality.

3.3 Ecosemiotics

Ecosemiotics studies ecosystems as communication systems [21]. This means that, unlike ecology or any natural science, ecosemiotics does not focus on the material aspects of the object of study, but its objects are the meaningful relations in a certain space. According to Denis Cosgrove [1] there are two distinct approaches to landscape studies, the ecological and the semiotic: The semiotic approach to landscape takes a sceptical view of the claims of science which mimetically represent real processes that shape the world around us. It places scientific emphasis more on the context and internal processes through which cultural meanings are invested and shape a world whose 'nature' is known only through human cognition and representation and is therefore always symbolically mediated.

More specifically, ecosemiotics is, in the broadest sense, regarding a branch of semiotics that studies point processes as responsible for ecological phenomena (species relationships, patterns and structures). In particular, studies the role of environmental perception and conceptual categorization in the design, construction, and transformation of environmental structures. Additionally, the ecology of perception aims at identifying a metaphorical framework (world-environment), through the establishment of a complex of factors of mainly active identities [22]. However, perceptual semiotics in practice is produced through the reification of their environmental signs, through comparisons and assemblages with disparate sensory fields (auditory, visual, tactile, etc.).

3.4 Antiquities and semiotics

It is empirically documented that the connection with the archaeological information is mainly achieved in cases in which the visitors have perceptually appropriated the archaeological site [3]. However, the ruins of archaeological sites, as well as any other set of outdoor ancient monuments, due to their dilapidated state, provide only visual information. Through these symbolic connections, each point and characteristic of their form is mostly arbitrarily or conventionally linked to its reference point. Thus, perception and thinking about content remains vague and incomplete.

Semiotic analysis focusing on the relation between monuments (ruins) and their natural environment, or lack thereof, and how this dimension can be used in cultural management to initiate archaeological environment-friendly cultural forms and practices of experiential appropriation with the archaeological and historical conceptual information of the landscape [23].

4 Study area: The botanic garden and the archaeological site of Mon Repos in Corfu island (Greece)

The study area of this work is the botanic garden and the archaeological site of Mon Repos in Corfu island (Greece). (fig.1). The garden is a unique and emblematic example of the cognitive condemnation of an "Edenic" memory: the closer the cultural visitor is to nature (to its constitutive values), the more he identifies with it, that is, forms a kind of conversation that restores it to full 'naturalism'. Every concept of the botanic garden is under the emblem of the relation with the observer-visitor, so that it must be characterized bilaterally, but also be understood as a space of discourse and intention [31], always maintaining its cultural identity.



Fig. 1. Planimetry of the Mon Repos area (site plan).

The current green area of Mon Repos, with a total area of 258 acres, is located on the hill of Ascension about two kilometres from the centre of Corfu town and is a recreational and sports area used from the population of the island. Its natural beauty and the archaeological findings of the area have made the botanic garden park one of the most popular places for visitors to the island. The park of Mon Repos is part of the ancient city of the island (Paleopolis), which was used by the inhabitants of Corfu from the period of Corinthian settlement (734 BC) until the Roman era [11]. The wider area is a point of particular historical importance, as it includes natural and archaeological monuments of various periods (fig.2).



Fig. 2. Topography of the archaeological remains of Mon Repos. Source: [25]

The first monuments were identified during the period of the Imperial French (1812), while the search for water sources for the needs of the navy during the period of the British occupation resulted in the accidental discovery of the temple of Kardaki a little higher than the homonymous spring [12]. At the beginning of the 20th century (1911-1914), during the research at the site of the temple in Kardaki (2012-2014), the German archaeologist Dopfler identified the organized sanctuary of Hera, which had a lifespan from the Archaic to the late Hellenistic period. The magnificent Doric temple of the sanctuary had two building phases, the Archaic and the Classical, while few building remains have survived from the Archaic temple. From the archaeological finds and the location of the sanctuary, which coincides with the descriptions of Diodorus and Thucydides, the Archaic and Classical temples were identified by the excavators with the Heraion, which was dedicated to the Extreme Hera and probably constituted the most important temple of ancient Corfu. The temple was destroyed during the conflict between the Oligarchs and the Republicans at the end of the 5th century BC [12].

All excavation processes are displayed through explanatory signs as also as evidence which are linked to the time of (in situ) process (photos). The visitors can observe and study these signs in resting areas near the archaeological sites [11].

5 Materials and Methods

For all the above reasons, the case study of Mon Repos is important mainly because it combines a complex factorial landscape with specific cultural, historical, and natural characteristics. Therefore, the study aims to investigate these characteristics and, more importantly, to correlate them with the semiotic "perceptual". The observation of the characteristics was accompanied by, a) direct observations of the researchers in the field, and b) by asking questions to the visiting public through the distribution of appropriate questionnaires.

The sample, divided into two categories such as tourists and residents, takes into account the different points of views of those who are the main users of the landscape and their needs. For each category of participants, a special questionnaire (e.g., in English for foreign tourists) of 6 pages and about 30 questions (both open-ended and multiple-choice) was therefore created, with a defined set of questions in order to define the semiotic perception of the landscape and archaeological remains.

5.1 Research design and data collection

To demonstrate the functionality of this approach, we chose to study Mon Repos due to different features from the spatio-temporal and cultural contexts, (antiquities, modern historical monuments, royal garden), thus allowing us to observe the perception of the most important location points in the landscape. These observations and the main research are conducted due to the context of interdisciplinary research fields and

practices (architectural, agronomic, recreational, aesthetic etc.) in this area.

The survey was conducted between February and April 2023. One hundred and fifty (150) questionnaires were distributed using the administration method in which the presence of the researcher encourages the completion of the questionnaire, thus decreasing the probability of non-response or no response [26]. One of the aspects addressed in the questionnaires concerns the landscape idea that cultural visitor feels not only in the aesthetic sense but mainly the emotional sensations. This issue was addressed by evaluating the definition of landscape provided by each respondent and was attributed based on the objective elements and characteristics that make up this natural landscape and the surrounded antiquities.

5.2 Coding and analysing the data

We used an open coding approach, looking for dialectic relationships between codes and concepts [27], developing key categories based on the research topic questions and working hypotheses. At coding process, relevant scientific literature on semiotics [28, 19] was perused and drew on the researcher's pre-existing understanding to identify and develop data leading us to new subcategories regarding the environmental cognition (Tables 1, 2).

Table 1. The semantic concepts on the perception of archaeological site.

Visual Elements	Semiotics of the Archaeological Remains	Social Semiotic concepts
Dome/ stones	Compound masonry walls	Foundations/ Stability
Crossings / pathways	Accessible area	Tour/Route
Cliffs	Not accessible area	Prohibition/ Danger
Dividing railings	Bounded area	Prohibition of entry
Description Plates	Signage	Information/ Critical importance
Columns	Ancient building	Respect/Sacredness
Stone mounds	Artificial slope	Intervention/ Enhancement
Broken fragments of ceramic	Remains- Archaeological site	Human Activity
Wood infrastructure	Architectural intervention	Technical Activity
marble slabs	Ancient building	Decoration

The bio-architectural composition of a botanical garden is equated to its ideality. From a semiotic point of view, the technical and physical elements shown on the Table

2, garden offer themselves as: a) the field of recognition of nature's productivity as well as functionality b) the articulation between contingency and environmental design.

Table 1. The semantic concepts on the perception of the botanic garden.

Visual-technical Elements	Semiotics of the botanic garden	Social Semiotic concepts
Crossings / pathways	Direction	Tour/route
Water groove	Resource	Refreshment
Flowerbeds	Building	Decoration
Stone seats	Time	Station-resting
Stone scales	Accessible area	Suspension
Plates	Location	Guidance
Plants-trees	Garden	Calmness-wellness
Waste bins	Suggestion	Cleanliness
Fire hydrants	Suppression	Emergence

Compared to the archaeological environment, the natural landscape and specifically the botanic garden is defined by quantitative and qualitative variations in the morphology of the characteristic elements, such as topological organization, technical infrastructure, natural elements, etc. Each discontinuity marks a human intervention.

6 Preliminary results

This article provides the preliminary results of this ongoing study. During our fieldwork process, multiple observations have been made and resting areas as also as viewing areas has been observed and evaluated.

6.1 The semiotic dialectic of signs in environmental aesthetics/design

The hermeneutic regime of perceptual signification is mainly concerned with a predictive understanding of relations through semantic categorizations and visualizations of the perception of the archaeological site as a "recreational site". Additionally, in every visual sign a specific meaning is given on numerous occasions. Thus, the perception and the context of the final image which is conceived is considered to be the basic idea (of the image) in conjunction with the all the previous contents and direct experiences.

At this point we will try to present the systematized findings of the first steps of the research (through our field observation) of the semantic approach of the botanic garden and archaeological landscape, arriving at a categorization of spatial properties. It should be pointed out, however that this schematization arises not only from the field observation, but from a cross-study of various contributions to social semiotics in landscapes [23].

The relevant thematic categories were chosen in order to distinguish the semantic field of antiquities approach and not only to present the different aesthetics under which is the visitor's perception of the landscape formed. In this sense, one of the objectives was not to only to outline a typology of the botanic garden but mainly identify the areas that characterizes the inherent cultural element in the (cultural) landscape of the garden.

In the following Table 3, are summarize the cultural embodied meanings identified as the development practices and activities in the natural environment of the garden and antiquities, which determine the level of cognitive action and activity [29] that develops between visitors and their sense of seeing and wandering around the area. Our approach incorporated important parts of the Mead's theory on "symbolic interaction" [30] about the observed behaviour of the sightseeing.

Table 3. Cultural embodied meanings by semantic actions (sightseeing and wandering) on visitor's behaviour.

Behaviour actions of visitors	Operational Semantic content	Operable semantic contents
Expression of interest	Stable/Incidental	Non-Deformable/Unchangeable
Visiting intention	Open/Exclusive	Appetibile/Congedabile
Knowledge recruitment	Frequent/Occasional	Appurabile/Non confidabile
Aesthetic valuation	Final/Definitive	Absolvable/Inoperabile
Cultural (naturalistic/archaeological) Admiration	Complete/Partial	Scientific/recreational
Living experience	Individual / Participatory	Psycho-spiritual

As we observe, despite the fact that a natural landscape is dominated by different actions seems to take us this side of a space of the operable/operational. The semanticisation cannot but take us back inside the factory of the constitutional (semiotics of experience), of the fitative (discursive semiotics) and of the operable/operative (semiotics of practices).

However, landscape cannot be attributed only to a semiotics of action (functionality) that contains an (individualized) behavioral intention. It mainly concerns signs and symbolic meanings which can constitute the

perceptual view (of the visitors) to such an extent that the sense of browsing in space constitutes a field of conscious existence.

Each point in space can not only stand autonomously (technically and functionally) but can be understood as the perceptual background that transforms (the selective perspective of parametric vision) into a level of expression and personal “conversation” with the wider area. In this sense, it was found that visualizations of signs in the space are categorized on the basis of the main following data: (a) diachronicity, b) discontinuity, (c) repetitiveness.

6.1.1 Diachronicity

The diachronicity refers to those parts of the site (archaeological and botanical) that are related to the synchronic identity, as a stable and non-stable (changing) presence of different monumental structures (standing stones, platform mounds, elite residences) and natural assemblages (botanic species). By the term diachronic identity, visitors defined the identity constituted by stable architectural structures and perennial vegetation. It is noteworthy that even in cases where timelessness was apparently identified with ancient architectural structures (through the criterion of antiquity value), the perceptual understanding of visitors was influenced more by the atmosphere of the site, i.e., by the created experience of contact with the surrounding space and not by specific visual data. It seems, therefore, that the timelessness of such spaces is directly and predominantly dependent on a psychological dimension rather than on the temporality of identity. Temporality, it follows, is presented as a temporality (of fixed moments) not predetermined but having significance only to the extent that it positively alters the mood for a space of high significance and historicity. The general temporal sense (of antiquity) betrays the very timelessness of things, suggesting that this timelessness as a sense is an experiential privilege in visiting the particular space independently of the strict measures of time.

6.1.2. Discontinuity

Theoretically, the perception of time (through browsing in space) seems to be automatically expressed mainly through continuity (in space) and this in turn giving the sense of homogeneity. At the same time, it seems that the reading of space (built and natural environment) is reflected in the visitors' consciousness through a logic of 'classification' of the elements of the environment and their reduction to multiple units expressing either similar or dissimilar temporalities. Therefore, what dominated the visitor's perceptions semantically was a generalized visual discontinuity.

In particular, the state of decay of ancient structures, which marks the ancient and also cultural element of the space, is based on the discontinuity of spatial units. According to this, the garden is perceived as the perimeter of an “institutional space” and the estate of

Mon Repos, including the adjacent, auxiliary buildings, and the other monuments, playing the second roles in the identity of the place, giving different physiognomies and consequently a visual spatial discontinuity. This is due to the fact that the variable of continuity tends to be perceived as a positive aspect on the geographical space, whereas discontinuity always has a negative connotation.

All cultural and natural spots, extended in Mon – Repos estate include also resting and viewing areas, but their location is in hard for the visitor to reach. [11, 24].

The natural pathways are a series of differentiated perceptual points as they lead visitors to unexpected area points through different small and hidden routes that are neither visible nor marked. This condition implies the visitor from a hierarchical route with specific points of interest. The randomness in the tour seems to reduce the degree of concentration.

6.1.3 Repetitiveness

The dominance of natural elements (landforms, terrain shape and elevation, or bodies of water) leads to the parameterization of perception in a correlation of space with a repetitiveness. In fact, visitors think of the place as already saturated with plant motifs. This repetition of plant motifs, which is directly related to the identity of a botanical garden or a public green space, does not allow the complete evaluation of antiquities as primary material elements (scattered within its spatial unit). On the contrary, it is this factor that also reinforces the fact of discontinuity which transforms the perception of quality into quantitative assessments and also into correlations that confirm the semantic property of architectural structures in the natural environment.

6.2 Environmental aesthetics between nature and ancient ruins and the importance in outdoor design processes

6.2.1. The bilaterality of the aesthetic determination in environmental design

In fact, the historical semiotics of this environmental landscape fully captures the naturalness of the wider area. In this sense, the landscape undertakes to create a spatial logic in which all the distinct functions (as a historical landscape of memory, as an archaeological site, as a garden) are simultaneously exploited. Hence, the understanding of landscape seems to pass obviously through the bilaterality of a 'poetic' and a structured place. However, it becomes clear how the natural element i.e., the botanical garden has emerged as an asset of the Corfu town area and is inscribed in the consciousness of visitors and local residents as a functional space with significant history and memory.

Moreover, the landscape of Mon repos has its own regularity of evolution, which is reflected through the traces over the time, as it offers as the field of functional practices (place of recreation, place of contemporary

memory, place of ancient history). On the one hand, the botanic garden is an emblem of a rephysicalization on the other hand it is seen as the seal of a natural microcosm (constructed space-environment, assigned to the fulfillment of different activities).

6.2.2. Interactivity and overlapping between semiotic findings and signs in environmental design

The above observation does not refer to the “visual think itself” but to the idea that the semiotic concept can be formed by the interpreter as a result of the visual think procedure.

According to Passini (1984) [33] in environmental design procedures the observed points of interest can be defined in a variety such as sensory one which leads the perception and the understanding of the place concluding an integrated development of the observer findings, orientation, and other aspects.

As it is mentioned above the points of interest can be defined by sensory features developed from the aesthetic expression and stimulation (semiotic findings). The basic semiotic, visual points which are considered in design are presented below:

1. *Orientation points* (pathways), information points (informative labels),
2. *directional points* (archaeological hedges, lines),
3. *identification points* (ancient buildings, ruins, monuments, residents, glades garden with exotic planting material),
4. *garden ornaments – architectural points* (statues, columns fountains, water springs/faucet),
5. *control points* (planting material – bushes, hillsides with loose rocks, stone mounds).

7 Limitations and Future Research

A larger sample size would allow the study more correlations. The absence of more data, however, showed no effect for the data that were not selected. The landscape factor which was examined in its perceptual dimension was quite complex - suggesting that there may be other semiotic categorizations which differentiate between sample categories with different qualitative characteristics, such as landscape designers and cultural management professionals. Further research may reveal these relationships.

8 Conclusions

The present natural landscape with its antiquities and historical monuments is a field for exploring the historical semantics of gardens and antiquities and their respective semiotics for environmental design. This study does not isolate the respective material and symbolic signs, but exchanges them with each other, regardless of their functional scope. The use of the present methodology allows design experts and spatial researchers to approach material signs analytically by examining the social - emotional and interpretative, defining each object as a sign (object sign), within a system of signs-concepts.

At the intersection of the fields of archaeology, landscape architecture and semiotics, the sign-object is positioned as a “medium” between the technical object, the architectural sign, and the phenomenal object. We argue that the objectivity of the phenomenological is thus transposed, making visible the stages of analytic and interpretive process of ancient ruins by being aware of a "personal objectivity". This approach seeks to enhance our understanding of the archaeological and natural landscape in a more experiential and social way, recognizing any limitations about our design knowledge and perspectives. By adopting this semiotic orientation, we are able to analyze and interpret the deeper meaning and significance of material culture, including landscape archaeology [7] and environmental design-architecture, in a more comprehensive and nuanced way.

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