

Visual Perception of Landscape: Sex and Personality Differences¹

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Abstract: The present study established relationships between individual differences and subjective evaluation of different kinds of landscapes. These were the first three principle components of the five components obtained from a matrix of coincidences. The three components used were: 1) natural versus humanized landscapes; 2) pleasant versus rough landscapes; 3) straight and neat forms versus round and diffuse forms. The subjects were taken from male and female university students. These subjects completed several psychological tests: CEP, 16PF and Embedded Figures Test. The data obtained from these tests were correlated with the components of the ecological test. The following hypotheses were presented for, and supported by the research that was carried out: 1) Personality structure conditions the choice of landscape; 2) the sex variable can influence landscape preference. This influence can be direct or influenced by personality factors.

INTRODUCTION

Defining landscape is not an easy task. The number of definitions that exist is proof of this. For example, the Spanish Royal Academy of Language considers landscape as: 1) Painting or drawing that represents a certain extension of land; 2) a portion of land that is considered in its artistic aspect.

Landscape is an inserted reality in human life that humans suffer from and enjoy daily. The environment is not landscape until people perceive it. Therefore, the methods of assessment, and even of description, can't be free from a certain degree of subjectivity.

Assessing landscape is a primordially subjective realization in which the perceiver's point of view, as well as that of the ecology in which the landscape is inserted, must play a part.

If people are an essential factor in the concept of landscape, psychological studies of the personality determinants, sex and age, are of elemental interest in its evaluation. This is so since it would bring us to a more complete scientific focus of the ecological-psychological-social structure of landscape. For without people, nothing more than nature would exist. This study would give the ecologist, architect, landscape architect, etc., objective facts about his own evaluation, which could be contrasted in an objective form with that of others.

Foundations exist for supposing that there are personality, sexual and cultural differences in the perception and appreciation of landscape. Perhaps the clearest example that we find is in the design of gardens. The comparison between English, French, Arab or

^{1/} Presented at the National Conference on Applied Techniques for Analysis and Management of the Visual Resource, Incline Village, Nevada, April 23-25, 1979.

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Japanese gardens can be an exponent, not only of the ecological or environmental differences but also of the cultural differences of peoples. The only problem that can exist is in discerning which is the cause and which is the effect. What is evident is that the relationship exists, and that people can influence the medium at the same time that this medium influences them. Even at the simplest level of theoretical analysis, the biological, the influence of the surrounding stimuli in the development of the central nervous system, is demonstrated, as was done by Rosenzweig *et al.* (1960). Or, as Piaget (1967) would say, man and all living beings in general, move on the Earth, transforming it, and modifying themselves by the action of their transformations; understanding that "adaptation" is an equilibrium between assimilation" (or the action of the living being over his surroundings) and "accommodation" (or the inverse action, that the living being never suffers in a passive form).

In psychology, studies about perception and perceptual laws are very developed since they are concerned with one of its principle areas of interest.

According to Fdez. Trespalacios (in press), in the animal kingdom, all manifestations of life can be analyzed according to three levels: biochemical, physiological and behavioral (intimately related). We can frame perception at the behavioral analysis level, considering it as the response to a configuration of stimuli.

It is convenient, at this point to make a distinction between sensation and sensation concepts. As Hebb (1968) says, sensation can be defined by saying that it is the activity of the sensory receivers as well as the activity resulting from the afferent canals to the corresponding cortical-sensorial region that it includes. On the other hand, perception would be the activity of the mediator processes induced by sensation. A mediator process is the configuration and analysis that the nervous system makes of the sensory stimuli that permit the construction of a meaningful world.

A sample of the complexity of perception from sensation can be seen in figure 1. This shows the distinct possibility of configurational arrangement from the same sensation (Hebb, 1968).

In conclusion, if we want to give a psychological concept or definition of perception, we have to say, along with Prof. Fdez. Trespalacios (in press), that it is a process by which the human organism informs itself about objects and the processes that are exhibited in them, via the sensorial configuration of informative stimuli.

The influence of experience and learning on the perceptual process has also been studied in this sense by behavioral psychology, the polemic remaining somewhat confused in the results; even though clear indications seem



Old Woman

Ambiguous Perception

Young

Figure 1--The distinct possibility of configurational arrangement from the same sensation (Hebb 1968, p.102).

to exist that a determining factor in perception is the possible significant loading of the stimulus, and that this meaningful connotation can be determined by learning or the previous experience of the subject. It could also be so because of the motivation produced by individual personality differences.

For its part, differential psychology has centered its interest on what relates to perception. This includes the perceptive differences between individuals of distinct cultures, above all in the field of optical illusions. That is, phenomena of visual perception that aren't reflected in the stimulation model, and of which the form is therefore independent from presented stimulus.

There are also studies that have tried to relate perception methods with personality types. Witkin *et al.* have analyzed the subject's perception and personality, dividing them into "field-dependent" and "field-independent" (in that which refers to perception). The "field-dependent" subjects tend to be dominated by the visual field if it is in conflict with other perceptions. The studies and investigations carried out to prove Witkin's theory are numerous, obtaining highly significant results. Literature pertaining to this can be found in several bibliographic information bulletins (Witkin, Oltman, Cox *et al.* 1973), and in three bibliographic supplements which appeared in 1974, 1976 and 1978. The research treats very diverse fields: drugs, stress, training, sex, age, personality, pathology, etc.

In the visual perception field, multiple forms of tricky visual forms have been conceived. One of them is that which corresponds to the Embedded Figures Test of Oltman, Raskin and Witkin (1971), which deals with separating a simple figure that has been introduced in a more complex design. The efficiency of field-dependent subjects is markedly inferior to that of field-independent subjects.

Burton (1975) indicates some work that is an attempt at approximation. Sonnenfeld (1966) presents data to show that cultural, age, and sexual differences are significant at the moment of determining landscape preferences, but he maintains the idea that the degree of environmental experience and individual personality differences are of greater importance. With less success, Winkel *et al.* (1969), tried to relate personality factors with the evaluative response of the individual to a design of the surrounding of a highway. No study has yet been able to establish the relative importance of personality and social factors in the variations of landscape evaluation.

In this line is the investigational work which we have carried out, with the object of relating personality factors with the individual's preferences to determined types of landscapes.

METHOD

Work Hypotheses

The hypotheses with which we set out in the present investigation are: 1) Personality structure conditions landscape preferences, and 2) the sex variable can influence landscape preferences. This influence can be direct or influenced by personality factors.

Samples Employed

The study we are explaining here was carried out with university students of the arts. The sample selection method was by conglomerates (Azorín Poch 1972, Cochran, 1975). Given that we initially had no knowledge of the population in the studied variables, the process was begun with a pilot sampling. The colleges or sections sampled at random were: psychology, language and literature, and geography and history. Once this step was completed, we proceeded to take the definitive sampling. A total of 226 subjects make up the sample, 142 women and 84 men.

Tests Employed

1. Ecological test:

A series of 15 slides of pairs of landscapes in photographs or drawings has been presented to the subjects, with a 5-second cadence. The test consists of choosing, in each pair, the one liked best, circling on the appropriate sheet that was provided, the "L" or the "R," depending on whether the left one or the right one was preferred.

The series of photographs or drawings we used to evoke reactions to landscape from the subjects (considering, naturally, that notable differences are contained with an evaluation process of real landscape) has been taken from the doctoral thesis of Sancho Royo, directed by Prof. González Bernáldez, and in turn is the result of previous investigations. (González Bernáldez, Sancho Royo *et al.* García Novo 1973, Sancho Royo 1974, Sancho Royo, González Bernáldez *y* García Novo 1972).

In the cited thesis, a block of 60 pairs of photographs or drawings of natural landscapes was used, and when the responses were obtained a correspondences analysis and a principal components analysis were carried out. As these proved not to be useful, a new method was proposed, coincidence matrix. Five principal components were obtained from this one. In the present paper we will refer only to the first three components, as these explain an elevated percentage of the total variance and seem to have a better interpretation:

Component I--This manifests polarity between unaltered, natural landscapes and humanized, artificial landscapes; this means a polarity between those without apparent human influence, whose elements are disordered, against very humanized landscapes, with a regular disposition of elements - farming, houses, etc.

Component II--This refers to the polarity between pleasant, sheltering, gentle landscapes contrasted to rough, inhospitable ones. The differentiating characteristic is mainly concentrated in the degree of vegetational cover.

Component III--This presents a polarity characterized by two fundamental notes - straight, neat forms versus round, diffuse forms.

For each of these components, we chose the five pairs of landscapes with the highest saturation in each component and practically no saturation in the other components.

2. Psychological Tests:

As for psychological tests, the following have been applied: two personality questionnaires, the CEP and the 16PF, and a perceptive test.

Prof. Pinillo's CEP personality questionnaire "is without doubt the best known and most utilized by Spanish psychologists. . . . The test, principally edited by the Spanish Institute of Applied Psychology, was conceived by its author, taking into account some already existing questionnaires, such as Guilford's STDCR...and the F and L scales (sincerity and stability) of the MMPI questionnaire." (TEA 1974).

The questionnaire is composed of five scales: control, extroversion, paranoia, sincerity and amount of doubts. Norms exist for application to sample from both sexes of professionals and students. Its application

can be individual and collective, and its scope of application is from 14 to 15 years and older, and for all cultural and professional levels.

Cattell's 16PF questionnaire tries to give a global vision of personality, based on the evaluation of 16 dimensions or first order factors, functionally independent and psychologically meaningful; and four second order factors. In its current form it depends on an empirical base of more than ten factorial investigations of several thousand elements. It is designed to be applied to adolescent and adult subjects. It is presented under six forms: A/B, C/D and E/F. The A/B forms have 187 items. These forms are the only ones adapted in Spain which are applicable to subjects with an educational level that is superior to the Superior Bachiller Level (high school).

In respect to the perceptive test, the Oltman, Raskin and Witkin "Embedded Figures Test" which we have spoken of previously has been applied.

3. Socio-economic questionnaire:

In this questionnaire, which we elaborated, we try to measure, in an approximate form, the economic and family level. In order to do this we ask for the father's, or the mother's occupation. The cultural level of the family is approximated by asking about the level of the parents' completed studies.

This has been done in this somewhat informal manner since the socioeconomic level doesn't make up a fundamental variable to study. But we think that it should be taken into account and we should have some approximate information about it.

Statistical Treatment of Data

At the moment of interpreting the amount of information that all these tests gave us, one must choose the most suitable statistical method so that everything can be adequately analyzed without loss of information. In this paper we are going to explain the results obtained with the Hotelling T^2 test and the Canonical Correlation Analysis (Dagnelie 1975, Cooley and Lohnes 1971, Tatsuoaka 1971).

Results

Once the tests were completed and the results obtained, we analyzed if the women and men had the same vector of averages in the studied variable. The results are pre-

sented in Table 1. Data confirm notable sexual differences.

Table 1--Differences between men and women.

T ² Hotelling	F	D.F.	Signific.
533.6623	13.8623	33 192	0.000

Analyzing each of the tests separately, significant differences appear in many of them; thus, there are differences in control variable of the CEP with $t=3.87(p<0.000)$, a favorable difference for the men; the men also had more emotional stability (C factor of the 16PF) with $t=5.28(p<0.000)$; the women had a more depressive personality (O factor of the 16PF) with $t=2.54(p<0.01)$; the men had more anxiety (QI factor of the 16PF) with $t=3.85(p<0.000)$, etc; all their differences in the personality variables and in the Embedded Figures Test gave a $t=2.23(p<0.027)$; while no significant differences appear at the moment of choosing landscapes.

If we observe the correlation matrix between the personality variables and the landscape components, carried out with all the subjects, there are many significant correlations (table 2). Of these we can cite:

1. Negative correlation between CEP scale E and Component I of the landscape test. The

subjects with high scores for social extroversion prefer humanized landscapes and vice versa, $r=0.136$ ($p<0.05$)

2. Negative correlation between CEP scale C and Component II-the subjects that score high in emotional control prefer pleasant landscapes, $r=-0.23$ ($p<0.01$)

3. Positive correlation between CEP scale C and Component III-the subjects with high scores in emotional control prefer landscapes with rounded trees and diffuse forms, $r=0.352$ ($p<0.01$).

If we separate the men from the women and we obtain their correlation matrix separately, we see that many of the significant correlations that were presented when they were together stop being so, while other new ones appear, although some of them remain the same (table 2). Looking first at the men, some of the significant correlations are:

1. Negative correlation also appears between 16PF factor C and Component I. Men with mature, personalities who deal with reality, prefer humanized landscapes, $r=0.427$ ($p<0.01$).

2. Negative correlation between CEP scale C and Component II-men who score high in emotional control prefer pleasant landscapes, $r=0.543$ ($p<0.01$).

3. Positive correlation between CEP scale CEP and Component III, as occurred with all subjects together, $r=0.236$ ($p<0.05$).

Table 2--Significant correlation coefficients between landscape and personality.

Significance	Men and Women				Men		Women	
	p<0.01	p<0.05			p<0.01	p<0.05	p<0.01	p<0.05
IA Natural Landscape	16PF:	CEP:			CEP:		16PF:	
	I 0.177	E -0.136			C -0.289		I 0.228	N 0.214
	QIII 0.182	16PF:			16P		QIII 0.227	
		C -0.138			C -0.427			
		N 0.139			F -0.398			
IIA Dry, cold Landscapes					QII -0.363			
	CEP:	16PF:			CEP		16PF:	
	C -0.230	B 0.161			C -0.543		G 0.233	P -0.209
	16PF:	C -0.171					N 0.233	16PF:
	E -0.252	I 0.142			C -0.595		QIII 0.300	B 0.200
	G 0.197	N 0.173			E -0.593			H -0.188
IIIA Diffuse Forms and Rounded Trees	QIII 0.209	QII -0.139						T 0.193
								Q3 0.178
	CEP:	CEP:			16P		CEP:	
	C 0.352	E 0.158			I -0.482	C 0.236	C 0.415	F 0.183
	16PF:	P 0.152			O 0.571	P 0.229	16PF:	16PF:
	C 0.250	16PF:					C 0.340	Q1 -0.215
	I -0.263	F 0.150					F 0.219	Q3 -0.190
	N -0.219	QIII -0.160					N -0.219	QIII -0.195
	O 0.236							

If we take the correlation matrix of the women, some of the significant correlations are:

1. Positive correlation between 16 PF factor I and Component I-women who scored high for a sensitive, insecure personality prefer natural, unaltered landscapes, $r=0.228$ ($p<0.01$).
2. Positive correlation between 16PF factor N and Component II-women with astute, worldly personalities prefer dry, cold landscapes, $R=0.233$ ($p<0.01$).
3. Positive correlation between CEP scale E and Component III-women with high scores for extroversion prefer landscapes with diffuse forms, $r=0.183$ ($p<0.05$).

With respect to the results of the Canonical Correlation Analysis, these results appear in table 3. Here we can see that the results change considerably by obtaining them from all the subjects or doing them with men and

women separately. In what refers to landscape, the major weights of the canonical variables are in Component III for the first canonical variable and in Component II for the second one when all the subjects are dealt with. When only the men are considered, the weights change, the major one being that of Component II for the first canonical variable and Component III for the second one. With the women, the weights that we found when analyzing all the subjects together are repeated.

DISCUSSION

We found, therefore, as we predicted in the hypotheses, personality structure conditions the choice of landscapes, since there are significant correlations in the separate analysis of the variables in the correlation matrices, and also when we employed the canonical correlation analysis.

Table 3--Canonical variables coefficients between landscape and personality questionnaires

	Men and Women		Men		Women	
	1 Canonical variable	2 Canonical variable	1 Canonical variable	2 Canonical variable	1 Canonical variable	2 Canonical variable
Set 1 Landscape						
IA	-0.026	-0.255	-0.021	0.652	0.012	0.297
IIA	0.046	1.188	1.018	-0.686	0.323	0.850
ILIA	1.007	0.305	0.604	0.846	1.078	0.118
Set 2 Personality						
C	0.460	-0.358	-0.232	0.541	0.391	-0.088
E	0.102	0.266	-0.124	-0.441	0.252	0.116
P	0.354	-0.070	0.102	0.132	0.267	-0.376
S	-0.217	0.019	0.046	-0.267	-0.221	0.154
?	0.112	-0.044	0.018	0.087	0.002	-0.018
A	-0.077	-0.240	0.151	0.134	-0.285	-0.286
B	-0.165	0.252	-0.075	-0.248	0.010	0.282
C	0.219	-0.059	-0.432	-0.110	0.219	-0.104
E	-0.240	-0.468	-0.457	0.401	-0.237	0.210
F	0.162	0.280	-0.026	0.083	0.227	0.229
G	0.106	0.640	0.199	-0.358	0.278	0.276
H	-0.175	-0.258	0.069	0.250	-0.341	-0.433
I	-0.183	0.083	-0.057	-0.480	0.054	0.458
L	-0.243	0.103	-0.104	-0.422	-0.133	0.144
M	-0.013	-0.298	0.092	0.207	-0.025	-0.147
N	-0.308	0.159	0.010	0.027	-0.355	0.200
O	0.439	0.097	0.599	0.467	0.098	-0.203
Q1	-0.191	-0.276	-0.036	-0.038	-0.202	-0.138
Q2	0.057	-0.048	-0.103	-0.243	0.078	-0.102
Q3	-0.347	0.063	0.029	-0.115	-0.345	0.062
Q4	-0.113	-0.396	-0.116	0.191	-0.029	-0.172
Q1	0.020	0.115	-0.083	0.125	-0.059	-0.121
QII	0.051	-0.221	0.088	-0.392	0.155	0.096
QIII	-0.025	-0.343	-0.220	0.245	0.024	0.335
QIV	0.250	0.199	0.029	0.307	0.010	-0.022
Canonical Correl.	=0.602	=0.478	=0.845	=0.732	=0.655	=0.554

On the other hand, the second hypothesis was also supported. We observed that though there were significant correlations in both forms of analysis, joining men and women and separating them, the correlations changed, and those correlations, significant in one form of analysis, were not the same as in the former one.

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