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THE PUBLIC VIEW OF THE COAST: TOWARD AESTHETIC
INDICATORS FOR COASTAL PLANNING AND MANAGEMENT

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ABSTRACT

This paper is based on the preliminary findings of a research project attempting to identify critical indicators of the visual quality of the coastal landscape derived from user perceptions and evaluations. Four two minute long 16mm films were made of four different locations on the Los Angeles area coastline recording a 360° view and ambient sounds. These films were shown at the Hollywood Preview House for audience response. The audience (n=377) was given a questionnaire after each film segment was shown and asked to evaluate the environments represented in the film. A subset of this audience (n=150) was required to register their immediate reactions while watching the films by turning a dial attached to the armrests. The device is known as Instantaneous Response Profile (I.R.P.) recorder. Other demographic, behavioral and attitudinal data were obtained via a second questionnaire. This paper will report on the findings based on the data obtained from the I.R.P. recorder for only one of the four film segments. This particular film segment was taken in a location in the city of Long Beach. The findings suggest important differences among age-groups in perceptions of aesthetic quality; they also suggest that most of the environmental elements identified in this study may be valid indicators of aesthetic quality.

1. INTRODUCTION

This paper presents some of the preliminary findings of a user response study designed to identify and establish the validity of a set of environmental quality indicators that can be utilized to assess the overall esthetic quality of the coastal landscapes. The study is based on the premise that a fundamental step in the development of an objective assessment methodology is the identification of components or indicators of the environmental quality being assessed. The measures and aggregation schemes can only follow once the indicators are established.

While there are many different ways of establishing environmental quality of indicators, as a recent state-of-the-art review of literature (EPA, 1973) suggests, most of them are arbitrarily chosen, or at best, based on judgments of experts or technical staff of agencies

usually responsible for managing the quality of our environment. The proclaimed objectivity of such procedures are often suspect, and untenable particularly when such intangible environmental qualities as aesthetics are involved. Hence, this study was designed to identify the indicators of aesthetic quality on the basis of responses of a cross-section of users of the environment.

1.1. Background

The interest in this study grew out of one of the authors' involvement in the development of the "Appearance and Design" element of the South Coast Regional Plan of the California Coastal Zone Conservation Commission. The commission was established by a popular initiative known as "Proposition 20", introduced in the ballots of the November 1972 elections in California. The initiative mandated the preparation of a coastal zone plan for the entire State by 1976, and specifically called for restoration, enhancement and preservation of scenic resources of the California coastline.

It became apparent during the process of preparing the plan, that there were very few known mechanisms to assess the scenic qualities of the coastal landscape. It was believed that such mechanisms would be particularly necessary to evaluate the effects of the appearance and design policies, once the plan is implemented at the state, regional and local levels. The broad objective of this study was thus seen as one of developing a set of aesthetic indicators. It was expected that they could serve many useful purposes in coastal planning and management: identifying areas of the coast that are in the need of preservation, restoration and enhancement; assessing esthetic impacts of future developments; monitoring changes in aesthetic quality over time; and so on.

2. THE METHOD

2.1. Determination of an Environmental
Display Mode

In searching for a suitable method of assessing environmental preferences the authors first examined the Process Model for the Comprehension of Environmental Displays (Craig, 1968) and the Taxonomy of Classification Techniques for Measurement and Analysis of Behavioral and Physical Design Parameters (Lozar, 1973). It appeared, from the review of these materials, that some version of a visual display of different types of coastal setting may be an effective way of eliciting responses from the subjects of this study. Further consideration of visual medium suggested that motion pictures would offer a greater versatility in representing a wider range of the ambient qualities and activities of an environmental setting. Through the use of a movie camera it is possible to capture a 360°

panoramic view of a setting. Furthermore, in addition to capturing the dynamic qualities of the environment it is feasible to record the ambient sounds, thereby making a more sensitive and complete simulation of the setting than would be otherwise possible.

Four locations on the Los Angeles area coastline (from the northern boundary of Orange County) were chosen as test environments for the study. These settings represented some of the broad categories¹ of coastal development ranging from low intensity natural settings to high intensity urbanized settings. In addition to representing the broad categories of coastal development these settings also manifested a wide variety of activities, structures, natural features and activity settings.

The films were taken with a 16mm camera, using a variable length lens, on a tripod; the sounds were recorded separately with a tape recorder and a sound boom. The sound was later merged with the film as an optical sound track.

A standard system of photography was developed for filming the settings, to minimize any "journalistic" biases of the researchers or the cameraman. The level of the tripod was kept constant, and an uniform clockwise "panning" sequence was used for all four settings. The panning sequence involved rotating the camera in a slow pan for about 45 degrees, then holding it steady for seven or eight seconds;² the "pan" and "hold" sequences were alternated eight times to complete a full circle of the camera movement.

According to this system a 360° panorama could be completed in less than 2½ minutes, a length of time regarded as adequate for conveying the sense of the environment.

The filming always began with a randomly selected focal point of each setting. The sound boom was also moved and held steady following the camera rotation pattern. After each film sequence was completed, the crew set up still photography equipment and, using a "panorama head" adpater, took color transparencies and black and white photographs for later use in analyzing audience response to the films.

¹ The choice of these locations was based on the analysis of coastal development pattern done as part of the "Appearance and Design" element. See South Coast Regional Commission, Appearance and Design, (adopted September 30, 1974).

² This "hold-pan-hold-pan..." sequence was chosen over a continuous "pan" sequence to avoid excessive "strobing" effect (caused by shutter motion in the camera), which might have caused a loss of bearing, confusion, if not dizziness, among the viewers.

2.2. The Response Format

Once developed, a content analysis of the films was done using instant recall of several different groups of viewers. These viewers, totaling 50, came from different backgrounds, ranging from students and secretaries to professors and the professional staff of a regional planning organization. Each group was instructed to view the film paying close attention to the content. Following each film the reviewers were asked to write down everything they remembered seeing in the film, and their impressions of what they saw. The free recall responses proved quite useful, for they represented an exhaustive range of elements perceived to exist in those films. The responses could be generally classified under the following categories: Beach Activities, Water-based Activities, Beach Objects, Water Objects, Land Objects, Distant View, Sounds and Qualities. However, from the sum of the open recall responses it was possible to extract 44 specific elements or element categories that seemed to provide a reasonably exhaustive checklist to describe the contents of all four film segments. This checklist was used as part of the larger audience evaluation of the film segments.

Each item on the check list had a "beautiful - ugly" rating option, so that a respondent could not only check what he/she saw in the film but he/she could also evaluate the element he/she checked as beautiful or ugly. In addition to the aesthetic judgment regarding each of the elements four other broad evaluative judgments were solicited on the questionnaire. These pertained to a respondent's perception of the total environment. On five-point rating scales the respondents were required to rate the environment. On five-point rating scales the respondents were required to rate the environments in terms of development (intensely urban - rural), beauty (extremely beautiful - extremely ugly), complexity (extremely complex - extremely simple), and interest (extremely interesting - extremely dull).

To assess the relevance of demographic and locational characteristics of the sample population on their responses to the environmental display, the authors designed a demographics questionnaire and a supplemental questionnaire inquiring about the time required for the respondent to get to the Pacific Coast, frequency, length and purpose of visits to the coast, preferred recreation location (wilderness, coastal areas, mountains, cities, etc.) and a coastal area activity check list consisting of 40 items. A final question asks if the respondent voted on Proposition 20, and if they did whether it was pro or con.

2.3. The Testing Facility

In trying to optimize the costs of doing a statistically valid study the authors utilized the services of A.S.I. Market Research, Inc. This organization operates a market study complex known as the "Preview House" in Hollywood. This somewhat unique service (the company operates similar facilities in Florida and Japan) is primarily utilized by the television networks and television commercial studios to obtain independent and advance rating of their productions. The majority of television shows and commercials are audience tested in the Hollywood Preview House.

The Preview House processes over 3/4 of a million respondents through its theatre yearly. It has a skilled staff of demographers, data analysts, experiment designers and engineers. Every night two or three clients pay to use a block of the 2 hour testing time with over 400 respondents in the theatre. The respondents that comprise the audience are recruited in the Los Angeles area by trained interviewers, who initially select the sample in the field by means of quota samples, based on desired characteristics of sex, age, or in certain cases a group selected by a client.

Statistically, the sample is not totally representative of the population of the Los Angeles Metropolitan area; it is usually biased toward younger age group, higher median income and higher education level. Nevertheless, the sample has proved reasonable reliable to make predictions about television commercials and shows not just regionally, but nationally. In general, however, the sample represents a reasonable cross section of the metropolitan population.

Prior to the beginning of the evenings testing each respondent fills out a comprehensive demographics questionnaire. The data from this questionnaire is provided to all the clients, in addition to their own test results. These negated the need for the authors to provide their own demographics questionnaire.

The Preview House also has additional response measurement tools, one of which is the Instantaneous Reaction Profile (IRP) Recorder. In this study the authors made use of the IRP Recorder (also called the Instantaneous Interest Measure). To use this tool a specially selected sub-sample of 150 persons is assigned to seats in the theatre which are equipped with dials for the Instantaneous Reaction Profile Recorder attached to the armrests. These respondents are instructed to manipulate their dials during each of the film sequences and to register their opinions of what they liked and disliked in each film. This represents somewhat of an adaptation of the device, which was intended to measure interest; however the principal of reaction is the same. Prior to the screening of the films the dial respondents

were shown a control film cartoon of Mr. Magoo, which has been used with every sample to establish a baseline response from the dials. As the films were shown during the experiment the IRP Recorder integrated and recorded the audience's instantaneous reactions to the film content in the form of profile curves.

The profile curves are measured on a scale ranging from 0 to 1000 with the normal position on the dial corresponding to the numerical value 500. The height of the resulting profile curve above or below this normal line is the measure of positive or negative response by the film. Readings are taken from the graph every five seconds, giving a more general description of the trends. The authors broke the sub-sample respondents into four groups; Total audience, male-female, under 25, 25 to 49, 50 plus and income over 1,250 dollars per month and below 1,250 dollars per month.

2.4. The Testing Process

The audience was informed that they were participating in a study being conducted by one of the larger local universities. Then the respondents were asked to fill out the preliminary location-activity-attitude questionnaire. These were then collected and everyone was asked to watch the following short films about the coastal area, and following the film to respond to the first questionnaire (Check-list and ratings). The dial-respondents were also asked to respond during the film and to respond to the questionnaire. This procedure was repeated for four films. The entire elapsed time for the administration of the four films, the instructions and the completion of responses was thirty minutes.

In order to analyze this IRP profile against specific contents of the films, a videotape of the film segments was made. Using a color video play back unit, and several stop watches, the authors timed the films on a linear montage of the panoramic photographs taken at each site noting the exact timing of the camera holds and panning sequences for each film, as well as the five second intervals from the commencement of each film. Transferring the data from the IRP Chart onto the graph below the panorama provided an indication of the vicinity in which the IRP responses were generated. (see Figure 1). The graphed responses to the film provide a comparison to the recall protocol and ratings for each film, suggesting possible relationships between immediate and retrospective evaluation of environmental characteristics.

3. FINDINGS

The findings presented in this paper are based on preliminary analysis of the output obtained from the Instantaneous Reaction Profile Recorder and the checklist and rating questionnaires

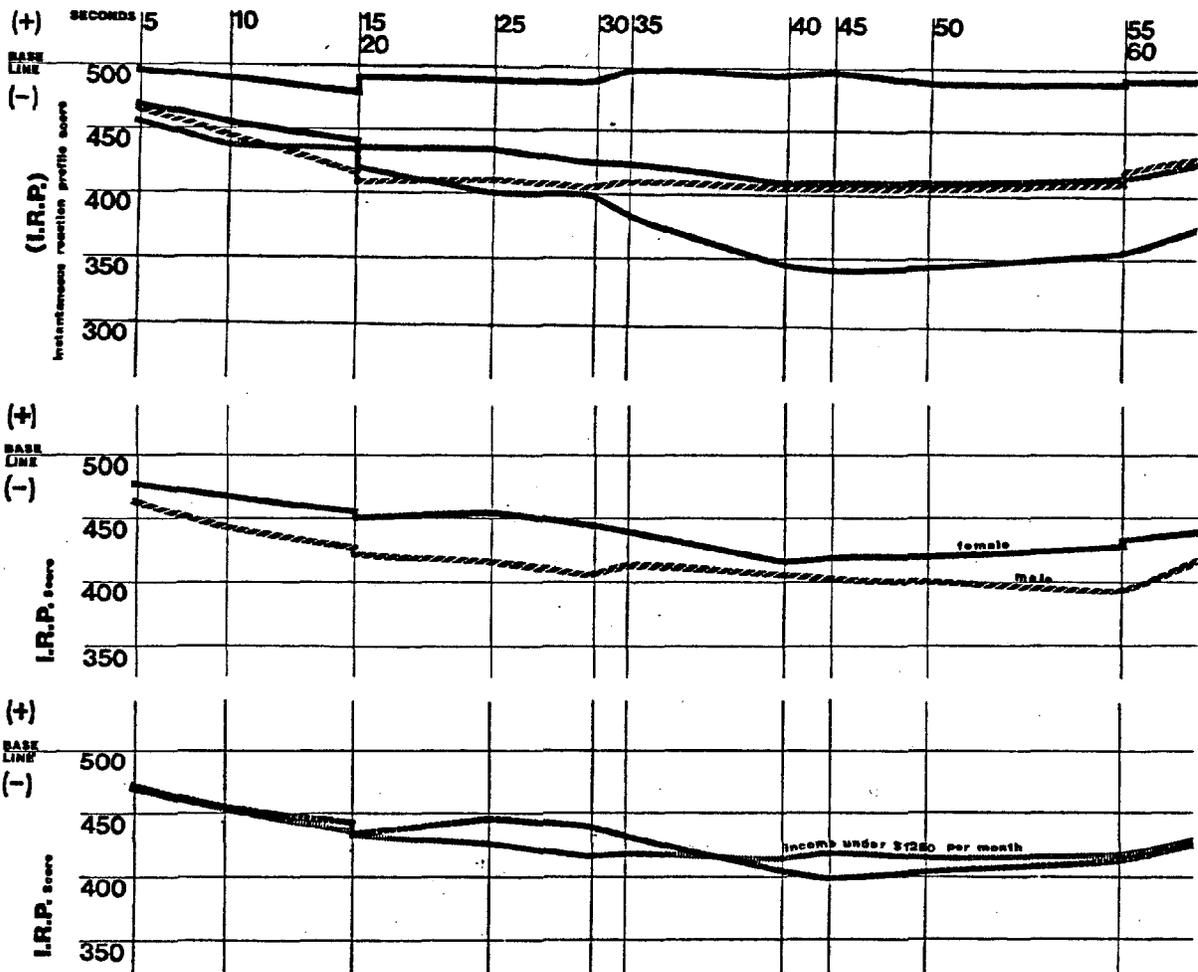
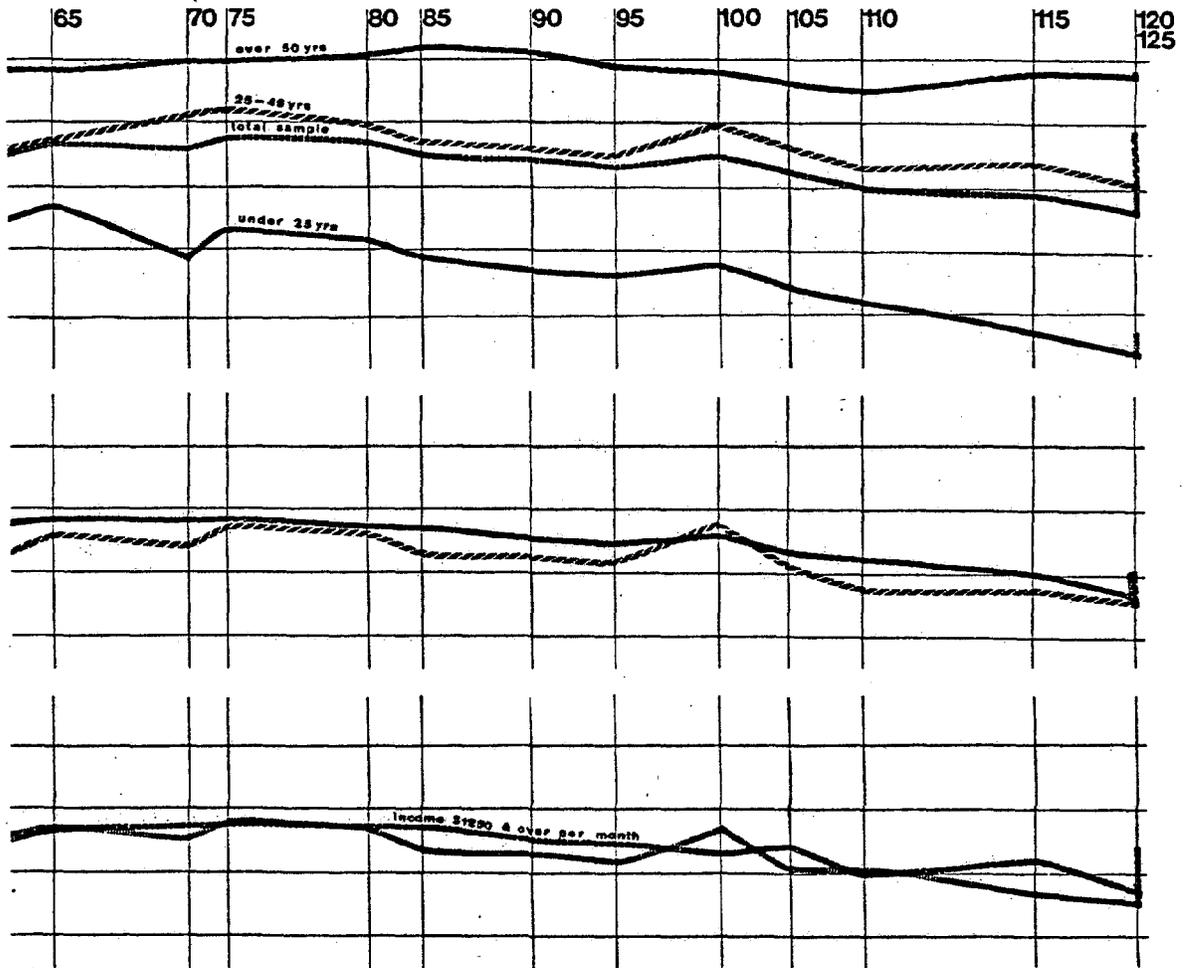


Figure 1. INSTANTANEOUS REACTION PROFILE SCORES BY SEX, AGE AND INCOME

provided after the showing of each film segment. Furthermore, this analysis will be limited to the audience reaction to the film segment taken in the Long Beach setting only.

The Long Beach film segment portrays a highly urbanized coastline, with a number of highrise apartment, office and hotel complexes. The remaining skyline consists of almost a solid wall of medium-rise buildings, which are mostly residential. The film was taken at a point where a recently finished coastal highway meets Ocean Avenue, one of the major thoroughfares

in the city. The film segment also includes views of a number of offshore oil islands, (cleverly camouflaged to look like landscaped parks with modern structures), vast expanses of sandy beach, parking lots, and some vacant areas. The celebrated oceanliner Queen Mary, (now permanently anchored in the Long Beach harbor) can also be seen in this film segment along with the derricks and cranes of the dock area, and the civic auditorium which looks like a giant oil storage tank. These elements can be recognized in the 360° panoramic view shown in Figure 2.



The three sets of graphs below the panoramic view of the Long Beach setting are based on instantaneous reaction profile scores for the audience broken down by age, sex and income respectively. Vertical lines represent intervals of 5 seconds; when two numbers appear on the same line, it means that the camera was held steady at that point for over 5 seconds. The fact that the vertical lines appear at uneven intervals merely reflects the fact that the camera movement was uneven, and that it was not always possible to strictly adhere to seven to eight seconds holding time, as planned orig-

inally. These variations are to be expected, since the camera movement was manually controlled.

The horizontal lines represent only a segment of the entire scale of instantaneous profile scores (which range from zero to 1000) within which the scores for this film segment were limited. These scores represent a normalized aggregate for the particular group of audience one is interested in. A score of 500 represents a neutral position, and always the time zero position, when all the dials are set at the

middle location. If everyone in the audience turned their dial to the extreme left (negative reaction) the cumulative normalized score for the whole audience would be zero; if everyone in the audience turned their dial to the extreme right position (positive reaction) the cumulative normalized score for the whole audience would be 1000. Similarly, if every male member of the audience turned their dial to the extreme left position, the cumulative score for that population group would be 0, if all males turn their dials to the extreme right position, the cumulative score would be 1000, and so on. In these graphs the high profile score never went over 510 and the low profile score never under 250 (Hence it was not necessary to show the entire range of score in the diagram).

Some general trends in the reaction profile can be identified fairly easily from visual inspection. First, it is clear that as the film progressed, the negative reactions increased for the audience as a whole, and all other demographic groupings, with the exception of the older age group (50 and over). However, the decline in positive reaction was not uniform. It appears that as the water, water related activities and the beach become first visible there is an upturn in the reaction profile curve. However with the appearance of the islands, and parked cars in the foreground the negative reactions continue to increase. Second, the view of the water makes a sharp rise and that of the islands a sharp drop among the youth. The appearance of Queen Mary seems to have a sharp rise among audience who are between 25 and 49 years old, male and income are under 1250 dollars per month. Third, and significantly, there appears no major difference among those with income over 1250 dollars and those under 1250 dollars, in terms of overall reaction profile. Fourth, the male respondents seem to be a little more critical of the environment than the female respondents. Finally, and perhaps most significantly, the difference between the three age groups is quite dramatic. The youth appear to be most critical, and the old least critical (infact, almost indifferent, since their profile curve hovered around the 500 line throughout), while the middle age group seemed to lie in-between and similar to the overall audience profile. This difference seems to indicate that perhaps

there is a "generation gap" in critical attitudes and levels of tolerance toward high intensity development in the coastal area. We don't know the extent to which this may reflect difference in fundamental value orientations of the younger age group in contrast to the older age group. Perhaps the environmental movement that began in the late sixties and early seventies -- including such events as celebration of the Earth Day in college and school campuses -- has had greater impact on the youth more than other age groups. Perhaps this merely reflects the fact that the youth of Southern California treasure the coast more dearly than others, for they are most actively involved in the enjoyment of this resource, and so on. At any event, the difference in tolerance level toward man-made adaptations of the coastal zone certainly makes the task of indicator building difficult.

Admittedly, the descriptive interpretation of the reaction profiles in terms of the contents of the film is somewhat speculative, particularly since we did not know if the reaction time (i.e. the time it takes a subject to see something in the film and to register his reaction by turning the dial) was substantial. However, it is our belief that the collective reaction time probably never exceeded one or two seconds and did not effect our interpretations of broad scenes. For our interpretation seems to be independently confirmed by the data obtained from the checklist part of the questionnaire which was handed out after showing of each film segment.

It will be recalled that in the checklist type questionnaire, the respondents were asked to check only those items they saw in the film and indicate whether they thought they were ugly or beautiful by marking the appropriate blanks. Thus, in effect, the checklist served at once a recall and an evaluative instrument. Tables I and II show the ranking of the elements that were checked as beautiful or ugly by the total sample, and various age groups. For brevity's sake only those elements checked by more than a third of the sample group are included in the Tables.

A close examination of Figure 1 and Tables I and II will reveal the consistency in responses

TABLE I. ELEMENTS OF COASTAL LANDSCAPE SEEN AS "BEAUTIFUL" (Rank ordered by frequency of mention) BY AGE GROUP 1

Total Sample (N=377)	Under 25 years (N=137)	25-49 years (N=152)	Over 50 years (N=88)
Water (65.8)	Water (64.2)	Water (65.8)	Water (68.2)
People in Beach (55.4)	People in Beach (63.5)	People in Beach (52.6)	Ships (51.1)
Beach/Sand/Dunes(48.5)	Beach/Sand/Dunes(56.9)	Ships (45.4)	People in Beach (47.7)
Ships (45.9)	Ships (43.1)	Beach/Sand/Dunes(43.4)	Beach/Sand/Dunes (44.3)
Distant View (36.6)	People in Water (42.3)		Large Structures (40.9)
People in Water (36.6)	Distant View (38.7)		Distant View (39.8)
	Islands (38.0)		Highrise Buildings (38.6)
	Sound of Waves (35.8)		Sound of Waves (34.1)

1 Figures within parentheses reflect percentages.

TABLE II: ELEMENTS OF COASTAL LANDSCAPE SEEN AS "UGLY" (Rank ordered by frequency of mention)
BY AGE GROUP 1

Total Sample (N=377)	Under 25 years (N=137)	25-49 years (N=152)	Over 50 years (N=88)
Sound of Traffic (54.9)	Sound of Traffic (65.7)	Parked Vehicles (55.3)	Oil Equipment (45.5)
Oil Equipment (52.8)	Highways (63.5)	Sould of Traffic (54.0)	Industrial Structs.(44.3)
Industrial Structs.(50.9)	Industrial Structs.(62.8)	Oil Equipment (50.7)	Sound of Traffic (39.8)
Parked Vehicles (49.1)	Oil Equipment (59.9)	Vacant Lots (50.7)	Vacant Lots (36.7)
Vacant Lots (47.0)	Large Structs. (56.9)	Parking Lots (49.3)	
Parking Lots (46.7)	Parking Lots (55.5)	Large Structs. (48.0)	
Large Structs. (46.4)	Parked Vehicles (54.0)	Industrial Structs.(44.1)	
Highways (45.1)	Street Fixtures (52.6)	Traffic (42.1)	
Traffic (41.6)	Utility Lines (51.8)	Highways (41.5)	
Construction (40.6)	Traffic (51.1)	Construction (40.8)	
Street Fixtures (37.9)	Vacant Lots (49.6)	Highrise Bldgs. (36.8)	
Highrise Bldgs. (37.9)	Construction (48.9)	Roads (34.2)	
Utility Lines (36.1)	Highrise Bldgs. (47.5)		
Roads (35.8)	Roads (46.0)		
	Offices (38.7)		

1 Figures within parentheses reflect percentages.

obtained through the dials and the checklist. For example, "water", "people in the beach", "beach/sand/dune" are three elements that appeared consistently at the top of the list of "beautiful" elements for all age groups. At the same time Figure 1 shows an upswing in the reaction profile curve for all age groups as soon as those elements become first visible around 55-60 seconds time period. The element "ship" appears consistently in this list also; again in Figure 1 we can see a sharp rise in the profile after Queen Mary, the only ship in the scene, appears in the film.

Similarly the decline of the reaction profile curve generally follows the list of "ugly" elements. For the sample as a whole, and for all other categories of respondents except for the older age group, the sharpest decline in the reaction profile curve takes place in the first 40 seconds which shows most of the elements that appear at the top of the "ugly" list: highways, parking lots, sound of traffic large structures, vacant lots, street fixtures, and so on.

An interesting discrepancy in Tables I and II are worth noting. While the "oil equipments" rate high in the "ugly" list among the under 25 age group, the "islands" appear in the "beautiful" list. In the Long Beach scene the "islands" (which are man-made) are also the oil derricks. We do not know how many of our respondents are aware of this fact. It will be our guess that most residents of the Southern California region are familiar with this fact from their everyday learning about the region from friends, media, and so forth. However, for a non-resident or a relatively newcomer this may not be immediately apparent. For, unlike the offshore oil platforms in the Santa Barbara channel, or Gulf of Mexico, there is nothing the Long Beach oil platforms that resembles the all familiar oil drilling equipments, because everything is so carefully camouflaged. We suspect

that the respondents (38.0 per cent of the under 25 age group) who checked the islands as beautiful responded to the architectural forms and landscaped appearance of the islands without knowing that they are actually oil platforms; on the other hand, those who recognized them as oil platforms probably checked them as "ugly" (59.9 percent of the under 25 age group).

Despite occasional upswings, it must be noted, the overall reaction profile managed to remain in the negative zone (under 500) for the total sample and most other categories of respondents with the exception of the over 50 age group. This negative evaluation is generally confirmed by Table III which shows the overall evaluation of that particular film segment obtained by means of the separate questionnaire handed out after the showing of the film.

4. SOME OBSERVATIONS

In this paper we have reported the data obtained from the instantaneous interest measurement instrument for only one film segment. We would of course expect different patterns of overall responses for the other three film segments which present completely different types of coastal settings; an undeveloped natural setting; a marina that shows residential and recreational uses; an industrial site on the coastline. If similar differences among groups persist, our speculation about generational differences in attitudes and perceptions will be strengthened substantially. Reactions to specific elements in the setting will also be noted to see if similar elements consistently evoke positive or negative reactions. If such consistent patterns can be found, a case for identifying those elements as the key aesthetic indicators can be made with some degree of confidence.

TABLE III. OVERALL EVALUATION OF THE LONG BEACH SEGMENT BY SEX, AGE AND INCOME

AUDIENCE STUDIES		15-9901 11		IN THEATER		07/30/75	
ENVIRONMENTAL FILM		MARINA/LEO CARILLO/LONG BEACH/SCATTER					
TOTAL AUDIENCE	MALES	FEMALES	TOT AUD UNDER 25	TOT AUD 25-49	TOT AUD 50 AND OVER	INCOME \$1250 OR MORE	INCOME UNDER \$1250
(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)
"LONG BEACH"							
DESCRIBE LOCATION							
EXTREMELY BEAUTIFUL	13 3.45%	3 2.00%	10 4.41%	4 2.92%	4 2.63%	5 5.60%	4 2.65%
SOMEWHAT BEAUTIFUL	88 18.04%	24 16.00%	44 19.38%	12 8.76%	29 19.08%	27 30.68%	30 19.87%
NEITHER BEAUTIFUL NOR UGLY	102 27.06%	45 30.00%	57 25.11%	46 33.58%	34 22.37%	22 25.00%	35 23.18%
SOMEWHAT UGLY	111 29.44%	49 30.00%	66 29.07%	45 32.85%	54 35.53%	12 13.64%	52 34.44%
EXTREMELY UGLY	34 9.02%	12 8.00%	22 9.69%	16 11.68%	15 9.87%	3 3.41%	15 9.93%
NO ANSWER	49 13.00%	21 14.00%	28 12.33%	14 10.22%	16 10.53%	19 21.59%	15 9.93%
* TOTAL RESPONDENTS	328 87.06%	129 86.00%	199 87.67%	123 89.76%	136 89.47%	69 78.41%	104 85.58%

Aside from substantive findings of this study pertaining to our search for aesthetic indicators of coastal environments, we are quite encouraged by the potentials of audience response format in future studies dealing with direct user responses to environmental displays. It is now generally agreed that survey research is becoming an extremely expensive tool for research, particularly if no compromise in sampling design is allowed. We might add parenthetically however that very few studies can maintain that degree of rigor. At any event, the cost of collecting 377 interviews would have been exorbitantly high if we had to do it by means of survey research. While we were not able to obtain a true representative sample of the region, we did have a sample that had some empirical credibility based on past experiences of the Preview House. Since we could not have undertaken a full-fledged survey research within the resources we had, we feel that the trade-off has been worthwhile.

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