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Analysis of the Image for Landscape of Port City

by

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Abstract

The purpose of this study is to obtain basic information available to make a new design concept at the first stage of landscape planning. Recently, with the large change of waterfront spaces, urban environments around port cities are getting more serious in Japan. So it is nesessary to begin planning to recreate the landscapes and facilities. However in this case we should consider the people's image and impression on curtural climate or environments to make fascinating townscapes. We sconsider two positions of people's image defined. One is the Media Image, and the other is the Residents' Image. Many current topics on tourist resorts or fascinating landscapes have been usually reported by visual and linguistic mass media in Japan. Many people form their images on townscapes without real experience. This image is called the Media Image and represents the external people's hope for spaces. On the other hand, the internal residents in the port city form their image by real experience or influence on their lives. This image is defined as the Residents' Image. Through a psychological experiment under the stimulus of visual media, this study specifies basic characteristics of the visual landscapes at representative port cities in Japan by comparing the two images.

1. Introduction

(1) Recent Waterfront Landscape of a Port City in Japan

The transportation system has changed variously, accompanied with social and economic change nowadays. For example, the main transportation means have changed clearly from ships to airplanes and the industry of shipbuilding or materials has depressed seriously in many port cities in Japan. As a result, many old and unnecessary warehouses and factories have remained in the vast space. With this large change of waterfront landscape, environments in the port cities around traffic facilities is getting more serious.

So, in order to improve the function of a port city and recreate the landscape, some waterfroht projects, of which concepts include the realization of human activity and life, have been planned in the port cities.

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In Tokyo Bay, old transportation facilities, warehouses and piers are converted into art museums or music halls for recreation and culture. New artificial islands such as the Port Island in Kobe have been constructed. They have an aim of creating a city space in which both transport and residential space coexist. For such projects and planning for enviroment innovation, it is basically important to consider the cultural climate and people's images on environments. If even a part of the relation between psychological space and physical space can be specified, available information for the decision to will the planning can be obtained.

(2) Definition of the Media Image and the Residents' Image

The concrete purpose of this study is to analyse the next two images. For one thing, there is the image entertained by onlookers as tourisits who don't reside in the port city but have an emotionol or visual impression even without the real experience of the space. This image is formed mainly through indirect experiences of watching the visual media or linguistic media. In Japan, many current topics on tourist resorts or facinating landscapes have been usually reported by the mass media. Especially, the visual media, such as pictures, movies and TV communicate the meaning of the landscapes from the artistic viewpoint and the most beautiful landscape. Its intensity of expression has influence on the images of the masses. This image is defined as the Media Image. The other is the image entertained by the residents of the city. This image is formulated unconsciously through their lives and real experiences of climate, landscape and community. This image is defined as the Residents' Image. The Media Image represents the external expectation in the planning area. It is necessary to satisfy both the internal and the external expectations for waterfront planning in port cities.

(3) The purpose of this study

The aim of this image analysis is to obtain basic information available for making a new concept or theme for landscape design of port cities at the first stage of planning. This study specifies the basic characteristics of visual landscapes about representative port cities in Japan. Through a psychological experiment under the stimulus of visual media the concrete purpose of this study is:

i) prescribe the semantic space about Media Image and classify the representative port cities on the semantic space

ii) abstract characteristics of port cities by specifying the difference between

the above two images

2. Description Method of the Image

(1) Describing the emotional meaning and visual scene

The sides of tne image described are the emotional meaning and the visual scene. The emotional meaning (semantic), originated from Osgood's semantics, is represented by adjectives. It is used widely when estimating landscapes or designed structures. Many studies have applied the Semantic Differential Method for landscapes, and abstracted the semantic space constructed by semantic factors. However, this method has the demerit that the estimations for spaces fall into an abstract definition because of the expression of a few adjectives. So, in order to cancel the demerit, we have added the description of a visual scene of the image. This description makes a linguistic (adjective) estimation concrete and visual.

(2) Forms of questionnaires

i) Selection of the language for estimation of port cities

The languages that prescribe the emotional meaning have been argued in connection with the valuation factor by the factor analysis. According to EDRA 1970's researches, physical environment has twenty semantic dimensions at least (1972 R.G. Hershberger), and Evaluation, Activity and Potency do not correspond with the physical enviroments. In this study, it is for each objective space that the semantic space should be abstracted. Based on this way of thinking, the collection of the language for the estimation should be performed by a free association test. The languages of port cities have been selected in the next process.

At first, we collect many adjectives by the free association method under the stimulus of slides collected from the visual media. Among many words collected, some words have been selected by their frequency of appearing. Rating scales have been made by adding opposite words to them. We omitted unsuitable words for representing port cities. As a result, we obtained 25 rating scales. Each rating scale has 5 stages of estimation. Testees must respond all rating scales.

ii) Describing the visual scene

After the stimulus of the slides, we have urged testees to recollect a scene in the port city naturally, and write a sketch and the name of the elements of the scene as best they can.

(3) Test of describing the Media Image

The Media Image has been described through a psychological test under a visual stimulus.

i) Scope of objective spaces in port cities for Media Image

It is supposed that the objective spaces for the Media Image are very wide in scope, including not only harbors but also the city area. It is impossible for testees to recollect the scene of harbors in detail. Also, there is a difference of scope between each port city. The difference is to describe the characteristics of the port city. It is impossible to prescribe the scope of the image strictly, but it is thought necessary for the city area limit.

ii) Selection of representative port cities

Considering that impressions are not as biased as possible, eleven port cities have been selected in the important harbors prescribed. That is, Hakodate, Sasebo, Kobe, Niigata, Onomichi, Nagasaki, Yaizu, Yokohama, Osaka, Maizuru, Tokyo. (shown in Figure 1)

Fig. 1 Selected port cities for investigation

*Underlined port cities are common to Media and Residents' Image

iii) Selection of slides as the stimulus

Considering that is easy to understand the whole impression of the city, ten slides per port city used as the stimulus of the test were selected from the visual media, that means books of pictures, travel guides books, and surveys of municipal administration. (shown in Figure 2)

iv) Testees and process of the test

The testees have been selected by 37 students of Kyoto University. The process of the test is as follows. At first, we've told the testees the name of each

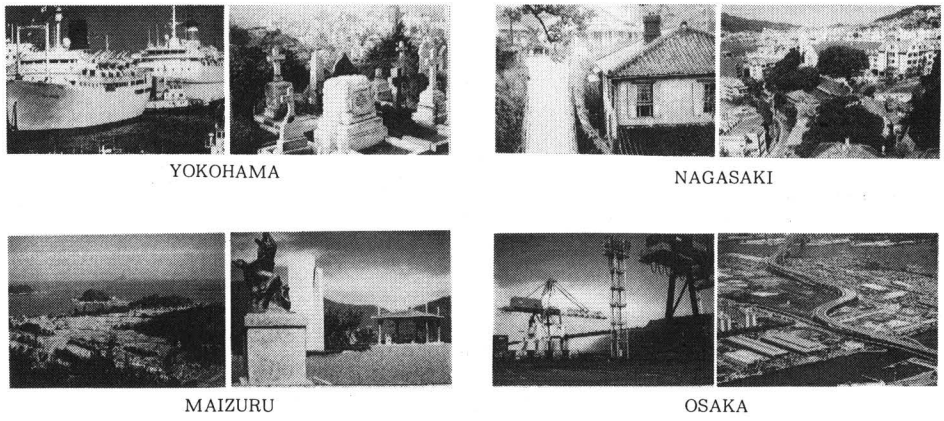

Fig. 2 Selected slides for stimulus

port city, and show ten slides for 30 seconds per slide. Secondly, we urged them to answer the questionnaire including the Semantic Differential rating scale and free association.

(4) Investigation of the Residents' Image

i) Process of the investigation

The investigation of the Residents' Image has been put in practice by sending the questionnaires, which include the same answer sheet of the Media Image with no stimulus.

ii) Selected port cities and testees

Among the port cities of the test for the Media Image, six ports, Nagasaki, Kobe, Yokohama, Osaka, Maizuru, Yaizu, have been selected for consideration for classification in the next chapter. About twenty five testees per port city have been composed by the staff of a section city planning of a local self-governing body.

3. Semantic Structure of the Media Image for Port Cities

(1) Extracting the Axes of the Semantic Space

The Varimax Method of the Factor Analysis was applied to the date from the rating scales in the investigation of the Media image, and yielded three common factors. The eigenvalues and proportions are shown in Table 1. The factor loading is shown in Table 2. As the accumulated proportion of the first and second factors is about 90 percent, we can regard them as axes of the semantic space. The third and fourth factors can be regarded as helpful axes to

Table 1 Eigenvalues and Proportion

	First Factor	Second Factor	Third Factor	Fourth Factor
Eigenvalues	9.82	3.65	0.76	0.67
Proportion	65.9	24.5	5.1	4.5
Accumulated Proportion	65.9	90.4	95.5	100.0

Table 2 Factor loading

First Factor	[Emotion for Classic Space]	
Classic	— Modern	0.791
Womanly	— Manly	0.775
Romantic	— Realistic	0.725
Curved	— Lineal	0.719
Beautiful	— Ugly	0.700
Second Factor	**[Ornament of Urban Space]**	
Prosperous	— Desolate	0.808
Sunny	— Gloomy	0.738
Free	— Feudalistic	0.726
Rich	— Poor	0.706
Third Factor	**[Order of Urban Space]**	
Ordely	— Disordely	0.564
Clean	— Dirty	0.508
Fourth Factor	**[Exotic Emotion]**	
Consumptive	— Productive	0.480
Exotic	— Japanesque	0.461

classify the objects on the semantic space.

(2) Classification of Port Cities on the semantic space

The factor scores for the previously mentioned four factors can be calculated by the following equation, that is

$$F=X(WA)$$

where X expresses the standardized date, A expresses the factor loading and W means the weight matrix. As a result of applying the Cluster the Cluster Analysis to the date, six types of port cities are shown when dissimilarity is 1.

Table 3 Classification and Characteristics of Port cities

Type A	Hakodate Nagasaki	Emotion for Classic Space Exotic Emotion
Type B	Yokohama Kobe	Ornament of Urban Space Exotic Emotion
Ype C	Tokyo Osaka	Modern and Urban
Type D	Niigata Sasebo Maizuru	Manly and Modern
Type E	Yaizu	Japanesque and Disordely
Type F	Onomichi	Emotion for Classic Space Disorderly

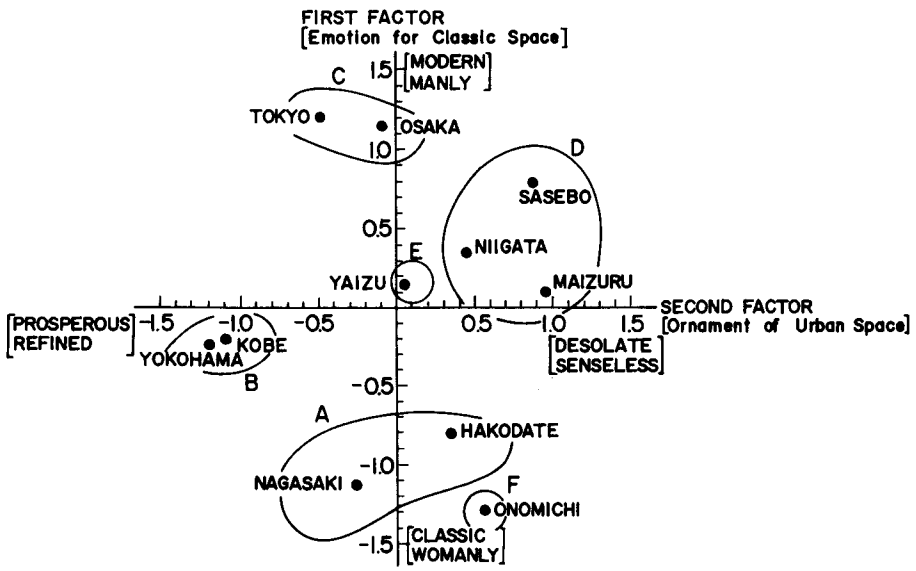

Fig. 3 Classification on the semantic space composed by first and second axis

8. The characteristics of each type are summarized in Table 3. The score of the port city is plotted on the semantic space in Figure 3. The difference among the types can be grasped clearly by this figure.

4. Comparison between the Media Image and the Residents' Image

(1) Macroscopic comparison of response between two images

The port cities common to the two investigations are Nagasaki, Kobe, Yokohama, Osaka, Maizuru and Yaizu. Their profile figures for each average score for the two images is plotted on the rating scales. They are shown in Figures 4, 5, 6, 7. The macroscopic difference between the two images can be grasped by them.

The resbmblance between the two sequential lines linked with the average score (on the Media Image and the Residents' Image) can be seen through all the profile figures of the port cities. That is, the similarity of relative tendency of response for the rating scales is high. However, observing the figures in detail, the line of the Media Image leans to a better meaning than that of the Residents' Image, or corresponds to that. (One group composed by the adjective of the rating scale means a better evaluation. Another group means a worse evaluation after making positive and negative factor loading uniform.)

Considering the results of the free association shown in Tables 4, 5, 6, 7, the reason for the difference is known as the following. Seeing the result of the free association, the main elements of scenes on the Residents' Image are industrial or transportation facilities around narrow seaside areas for any port city. On the other hand, the main elements on the Media Image are the composing of many scenes in a wide area of the city where people enjoy everyday life and sightseeing in the city where they can see the seaside.

(2) Characteristics of townscapes in port cities considering the difference between both images Characteristics of townscapes can be grasped by describing the difference of both images in each port city as the following.

i) Kobe and Yokohama

In the case of the Kobe rating scales, in which wide differences between the two images, can be seen are "womanly-manly", "weak-strong" and "light-heavy". The response of these scales on the Media Image leans to a better meaning. The words such as manly, strong, heavy describe industrial and transport townscapes. The main elements on the Residents' Image are "crane", "container ship", "bridge", "shipyard". These probabilities of remembrance are higher in rank.

In the case of the Yokohama rating scales, in which wide differences can be

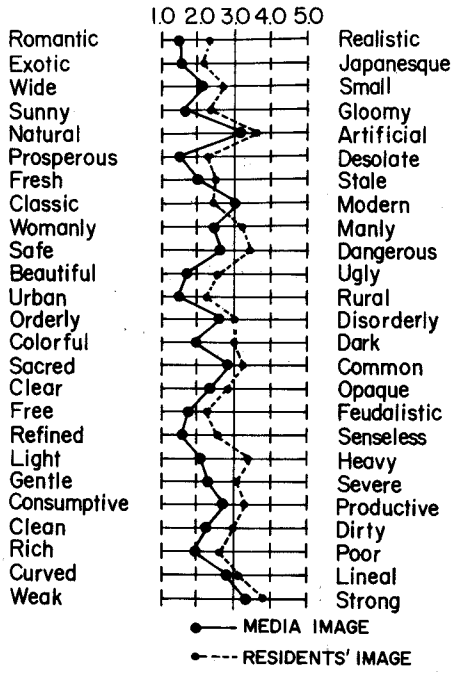

Fig. 4 Profile figure of average score [Yokohama]

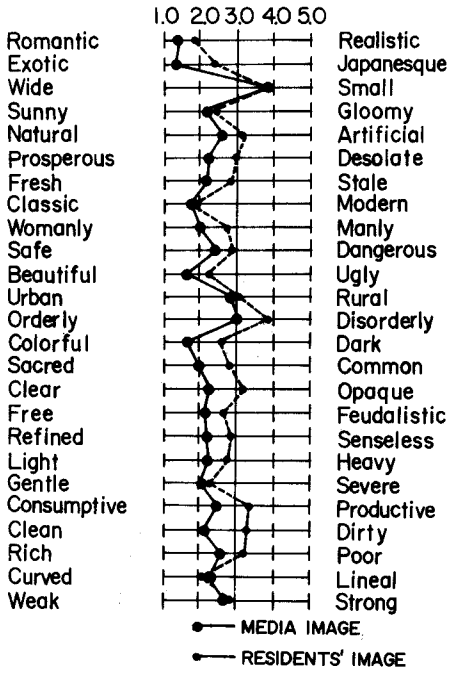

Fig. 5 Profile figure of average score [Nagasaki]

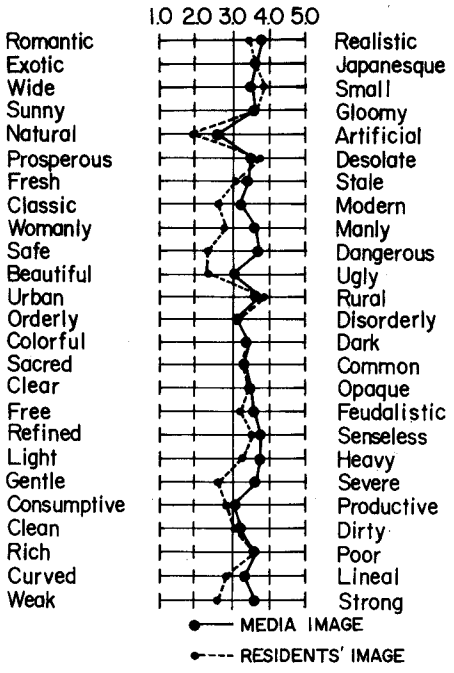

Fig. 6 Profile figure of average score [Maizuru]

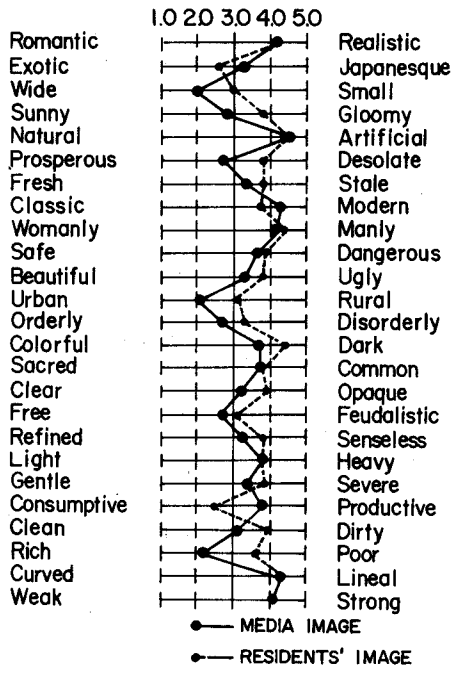

Fig. 7 Profile figure of average score [Osaka]

Table 4 Elements of visual scenes by free association test (Yokohama)

MEDIA IMAGE (37 testees)		RESIDENTS' IMAGE (20 testees)	
Frequency	Name of Element	Frequency	Name of Element
27	Foreign Ship	14	Foreign Ship
20	Park	10	Yamshita Park
17	Pair of Lovers	9	Crane
7	Foreigner	7	Brickbuilt Warehouse
6	Evening	5	Large Pier
4	Lawn, Bench, Hill	4	Container, Marin Tower Sea

Table 5 Elements of visual scenes by free association test (Nagasaki)

MEDIA IMAGE (37 testees)		RESIDENTS' IMAGE (20 testees)	
Frequency	Name of Element	Frequency	Name of Element
21	Slopes	20	Shipyard
17	Church	14	Fishing Boat
15	Old Foreign House	11	Tanker
11	Stone Pavement	9	Foreign Ship
7	Stone Bridge	8	Hill
5	Inlet	7	Warehouse
		6	Fish Market

Table 6 Elements of visual scenes by free association test (Maizuru)

MEDIA IMAGE (37 testees)		RESIDENTS' IMAGE (20 testees)	
Frequency	Name of Element	Frequency	Name of Element
13	Ferry	17	Timber
10	Inlet, Ship for Self-Defence	14	Ferry
		8	Mountain, Island
9	Repatriate Ship	6	Fishing Boat, Warehouse, Repatriate
8	Fishing Boat, The Self Defence Force, Waves	5	The Self Defence-Force, Ship for Timber
7	The Sea of Japan		

Table 7 Elements of visual scenes by free association test (Osaka)

MEDIA IMAGE (37 testees)		RESIDENTS' IMAGE (20 testees)	
Frequency	Name of Element	Frequency	Name of Element
20	Container	14	Bridge, Warehouse, Ship
16	Crane	7	Crane, Truck
13	Warehouse	6	Lighthouse, Freighter
12	Freighter	5	Quay, Container, Sewage
11	Bridge	4	Factory, South Port
8	Expressway, Industrial Complex		Evening, Sea Gull

seen, are "light–heavy", "refined–senseless", "colorful–dark" (showh in Figure 4). The response on the Media Image leans to a better meaning than the Residents' Image. The better meaning is regarded as left words of scales in the figure. High ranks of the probability of elements on the Media Image are occupied by the elements in the Yamasita Park facing the sea. So, elements of the Residents' Image resemble those of the Media Image over the second grade of probability of remembrance, but there is a difference under the third grade. That is, some scenes composed by big transporters "crane", "freighter", "container ship", and traditional facilities as "brickbuilt warehouse" have come out (shown in Table 4). It can be said that these scenes make the response worse. As a result of thinking about the above two port cities, it can be found that there is a difference of emotional meaning between both images and the reason for the difference is due to the industrial and transport scenes.

ii) Nagasaki

In Nagasaki, there are comparatively many rating scales regarded as significant by the test of difference, so it can be said that Nagasaki has a wide difference between the two images.

The rating scales in which wide differences can be seen are "clean–dirty", "consumptive–productive", "exotic–Japanesque" and "clear–opaque". The response of the those scales on the Media Image leans to a better meaning (shown in Figure 5). The main elements on the Media Image are "slopes", church", "old foreign house" in the residential area (uptown); and "stone pavement", stone bridge" in the historical town (showh in Table 5). The seaside can be seen from all places where these elements exist. The elements are located in the whole city. On the other hand, the main elements on the Residents' Image such

as "shipyard", "fishing boat", "tanker", "warehouse" are located in the narrow seaside area.

In Nagasaki there is a wide difference of emotional meaning. The scenes of the images separate into[1] the type located in the whole city and [2]the type in the seaside area. So it can be said that Nagasaki has the widest difference between the Media Image and the experienced image.

iii) Maizuru and Yaizu

As you can see, the profile figure on Maizuru in Figure 6, the emotional meanings of the two images closely resemble each other. Moreover, there is little difference about the elements of the scenes, that is, "frerry", "fishing boat", "ship for self-defense" (shown in Table 6). So, it can be said that Maizuru is a port city that has stable images about visual landscapes by both external persons and internal persons. Another way of speaking, it is an unchanging and simple port city. Judging from the detail of the profile figure the rating scales in which differences can be seen are "womanly-manly", "safe-dangerous" and "weak-strong". The scores of these scales on the Residents' Image leans to a better meaning.

The main elements on the Residents' Image are composed of some scenes of nature. The main elements higher in rank on the Residents' Image exist in natural landscapes such as "mountain", "islands", or in stasic landscapes as "timber yard in the sea" (shown in Table 6). So, Maizuru has more tender and stable scenes in the Residents' Image than the Media Image. In the case of Yaizu as well as Maizuru, the rating scales regarded as significant by the test of difference are compaparatively few. The profile figures between the two images recemble each other. The visual scenes are composed of elements in the fish market. So, in Yaizu there are stable scenes in the people's impression.

iv) Osaka

Judging from the profile figure shown in Figure 7, in Osaka there is a wide difference of emotional meaning between the two images. The rating scales where a wide difference can be seen are "rich-poor", "wide-small", "sunny-gloomy" and "prosperous-desolate". The scores of these scales on the Media image leans to a better meaning, but the scores on the Residents' Image leans to a worse meanning, except "consumptive-productive". The visual scenes composed of elements on both images correspond with the industrial and transport scenes shown in Table 7. So, the reason for the difference of emotional meaning cannot be explained by the visual scenes, but it can be guessed that the

reason is as follows.

Onlookers who don't reside in the port city think about scenes of visual Media prosperity of production or activity of industry on the Media Image. Its impression resembles the beauty of the moderns. The residents in the port city have the same image on the visual scene. However, because this image is formulated through their lives and experience, they add another meaning on everyday life to the impression of the visual scene.

5. Conclusion

This study suggests the Media Image and the Residents' Image, and shows a new meaning of townscapes at port cities by a comparison between two images. The summary of our considerations is as follows.

(1) Macroscopic comparison between the Media Image and the experienced image

The emotional meaning of the Media image is similar to that of the Residents' Image.

(2) The axes composing the space of emotional meaning

Four axes have been yielded by the application of the Factor Analysis. The meaning of the four axes are the emotion about historical space, the orhament of the urban space, the order of the urban space and the exotic emotion.

(3) Classification of port cities on the semantic space (emotional meaning) about Media Image

Six types of port cities are extracted by the Cluster Analysis. The characteristics of these port cities could be described on the semantic space clearly.

(4) Consideration about the difference of the emotional meaning between both images

Four types of port cities have been described by the consideration of the difference of the scores on the rating scales and elements of scenes.

(a) The port cities (Yokohama, Kobe) ; There is a difference and the reason for the difference can be explained by the visual scene of free association, industrial and transport scenes.

(b) The port city (Nagasaki) ; There is a wide difference and the visual scenes separate into [1] the type in the whole city and [2]the type in the seaside area

clearly.

(c) The port cities (Maizuru, Yaizu); The emotional meaning between the Media Image and the Residents' Image resemble each other. There is no difference with regard to the visual scenes. Static and stable scenes exist in the image.

(d) The port city (Osaka); There is a difference of emotional meaning. Because there is no difference regarding the visual scenes, it can be explained by the residents' impressions based on their lives and experiences.

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