A Study on the Psychological Evaluation of Tourism Landscape Images in Hiroshima
A Psychological Evaluation by Korean Subjects

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Abstract
In this study, similarities and differences in psychological evaluations of sightseeing scenes in Hiroshima by Korean, Chinese and Japanese subjects were examined to identify new and attractive features for foreigners. Forty scenes were chosen as the stimuli for the psychological experiments; these were sourced from sightseeing homepages in Hiroshima Prefecture. In the evaluation for 'Hope to visit', scenes that largely contained artificial elements received lower evaluations. In contrast, scenes that depicted nature and Japanese gardens received higher evaluations. Furthermore, no correlation was found between 'Hope to visit' and 'Similarity to Japan'. Scenes depicting characteristics were preferred to typical Japanese scenes, and subjects recognised the similarity between Japanese and Korean scenes, which explains their lack of desire to visit. Similarities and differences among the three subject groups were determined; however, since the subjects were living in Japan, they might have obtained Japanese knowledge and experiences. Therefore, further study is required to compare the results with evaluations of people who have not left their native countries.

Keywords: tourism landscape; sightseeing scene; cross-cultural comparison

1. Introduction
In recent years, Asian countries have shown rapid economic development, along with accelerated population growth. However, Japan is witnessing a population decline due to the country's low birth rate and ageing society. Future domestic demand in Japan is unlikely to expand, and Japan is being forced to face an industrial conversion with a global perspective. Under these circumstances, the Japanese tourism industry is attracting attention for its expected repercussions on various other industries; nationwide efforts are being directed towards industrial recovery, in particular, by strategising to increase foreign visitors, obtain foreign currency and vitalise communities.

Considering the above, research trends in recent years have seen an increase in research in the field of tourism, and many studies1-3 have been conducted from the perspectives of foreign tourist satisfaction and trends and evaluation of sightseeing areas. Several studies regarding the evaluation of popular sightseeing scenes by Japanese people and foreigners have also been conducted. Wuyunbagen et al.4 considered Japanese and Chinese students living in Japan as their test subjects and exhibited images that comprised green roofs in traditional and modern urban scenes throughout China and Japan to investigate the effect of students' evaluation of the two attributes and styles of green roofs. Moreover, Nishina et al. conducted various investigations on green scenes5,6 and river scenes7,8 using British, Japanese and Chinese students, living in the respective countries, as test subjects to more clearly understand the effect of differing socio-cultural factors, particularly in relation to river scenes. Although trends among Chinese and Japanese students were similar in terms of the degree of satisfaction derived from the scenes, the evaluation criteria evidently differed according to individual characteristics. The results of the present study are expected to produce the same findings as past research in terms of the similarities and differences in sightseeing scene image evaluations based on differences in cultural backgrounds; however, the details remain unclear.

As such, the present study aims to investigate foreigners' psychological evaluation regarding sightseeing scenes in Hiroshima and clarify the structure of this evaluation. A previous article9 reported psychological evaluation by Chinese students, Chinese
foreign students and Japanese students. The subjects of the present study were Korean, Chinese and Japanese students living in Hiroshima. This study reports the observed experiment results, including differences in evaluation trends by nationality.

2. Experiment Overview

2.1 Selection of Scenes for Presentation

The scenes presented to the subjects were selected from 778 sightseeing scenes posted in the photo gallery of one of Hiroshima Prefecture's tourism websites⁹; these were used as stimuli for the evaluation. The selected scenes were divided into 34 groups, and one scene from each group was selected. Furthermore, six scenes that were not tourism-related but deemed appropriate as comparison stimuli were selected, thus reaching a total of 40 scenes. We chose scenes without human activity and/or festivals and scenes that gave no indication of the location.

Next, based on the scene's elements, such as buildings, sky, trees, flowers, rocks, and the camera angle, hierarchical cluster analysis was applied to the 40 scenes. These were divided into three groups ('Artificial Scene', 'Traditional Scene' and 'Natural Scene'), which were further divided into 13 groups ('Shop', 'Factory', 'Modern Architecture' and so on).

2.2 Survey Details

The survey sheet comprised a cover sheet and scene evaluation sheet in the subjects' language. On the cover sheet, the subjects were asked to enter their attributes, such as their sense of values, character, travel experience and desire to travel in Japan, and knowledge of and interest in Japan. The scene evaluation sheet was used to determine their attitudes towards Japan within the categories 'Hope to visit' and 'Similarity to Japan' as comprehensive evaluation items. Moreover, the scene evaluation sheet enabled a psychological evaluation of 13 adjective pairs as image evaluation items based on the Semantic Differential (SD) technique. The main items of the survey sheet are shown in Table 1.

2.3 Experiment Method

The experiment with Korean and Chinese subjects was conducted in December 2010 while that with Japanese students was conducted in April 2011. The total number of subjects comprised 26, 90 and 127 Korean, Chinese and Japanese students, respectively. According to the experimental procedure, subjects were first given preliminary instructions and then asked to complete half the cover sheet. Before completing the other half of the cover sheet, all the subjects completed 40 scene evaluation sheets by utilising images projected on a screen by an LCD projector. The details of the images, such as the shooting location of the presented scenes, were not provided. For each of the nineteen experiments, the order of presentation of the scenes was changed. The total experiment time ranged from 1 h 15 min to 1 h 30 min.

2.4 Characteristics of Subjects

While there were more male Japanese subjects, there were more female Korean and Chinese subjects. Their age range was largely between 20 and 25 years, as the target groups comprised students. Their academic faculties included humanities, science and technology and integrated sciences. The most common field of study among the Korean and Chinese students was humanities, whereas <10% of the Japanese students studied the humanities. More than half the Japanese subjects were students of science and technology. Most Korean and Chinese subjects (>40%) had been living in Japan for less than half a year.

3. Comprehensive Evaluation

The results of the comprehensive evaluation items ('Hope to visit' and 'Similarity to Japan') by the three subject groups, answered on a 4-point scale that provided values from −3 to +3, are indicated as an average evaluation score profile in Fig.1.

Table 1. Contents of the Survey Sheet

| Cover sheet |
|-------------|
| 1) Subject's attributes |
| (gender, age, nationality, dwelling years in Japan, etc.) |
| 2) Sense of values |
| (12 items and four categories in each item) |
| 3) Character (15 items and four categories in each item) |
| 4) Travel experience/Desire to travel in Japan |
| (destinations, purpose, etc.) |
| 5) Knowledge and interest in Japan and Hiroshima |

| Scene evaluation sheet |
|------------------------|
| 1) Comprehensive evaluation (Four categories) |
| (Hope to visit, Interest, Similarity to Japan, Similarity to mother country) |
| 2) Image evaluation based on the Semantic Differential technique. (13 categories) |

Similar trends were generally found among the three subject groups' responses to 'Hope to visit', and 'Garden', 'Historical Architecture' and 'Valley' scenes received high evaluations. Characteristic scenes of 'Stones and rocks', particularly those that comprised white marble (21), received many 'Hope to visit' responses in the Korean students' evaluations. There were also many responses of 'Hope to visit' for 'Garden' (19) (33), 'Valley' (26), 'Snowy mountain' (18) and 'Yellow sunflower' scenes (14) (Fig.2.).

Under the category 'Similarity to Japan', a comparison of the results among the three subject groups revealed that Korean subjects tended to provide lower evaluations than the other two groups, except for responses to 'Shop'. For some scenes, Korean and Chinese subjects provided very different responses from those by the Japanese subjects. One of the features of the Korean students' evaluations was their partiality to traditional scenes, such as temple archways, castles and scenes of old towns, as well as scenes with carts. The 'Sea 1' scene was evaluated as being the most typically Japanese of the natural scenes.
The 'Sea 1' scene depicts the Seto inland sea; however, in comparison to the 'Sea 2' scene, the 'Sea 1' scene contains more mountains, stone statues and structures. Natural scenes, other than the 'Sea 1', were not evaluated as being typically Japanese, thus indicating a major difference as compared with Japanese subjects. Therefore, the Korean subjects associated 'Similarity to Japan' with scenes depicting structures rather than natural scenes. Thus, Korean subjects do not seem to regard natural scenes in Japan as being radically different from those in Korea.

During the examination of the Korean subjects' evaluations, no correlation was found between 'Hope to visit' and 'Similarity to Japan'. Characteristic scenes were preferred to typical Japanese scenes, and the similarity between scenes in Japan and Korea was recognised, which explains the lack of desire to visit Japan.

### 4. Image Evaluation Using the SD Technique

#### 4.1 Factor Analysis Results

Values of −3 to +3 were assigned to the image evaluation results of 13 adjective pairs using the SD technique and according to responses on a 4-point scale.

Table 2 shows the results of a factor analysis by principal factor analysis and Varimax rotation on the integrated data of the Korean, Chinese and Japanese subjects. Based on the bipolar adjectives having higher factor loadings, Factor 1 can be understood as 'Inherency', Factor 2 as 'Pleasantness', Factor 3 as 'Traditionality' and Factor 4 as 'Openness'.

#### 4.2 Average Factor Scores

Each scene's average factor score, calculated using overall factor scores, is shown in Fig.3. Results revealed that for Factor 1 ('Inherency'), 'Historical Architecture' commonly received high responses from all the Korean, Chinese and Japanese subjects; however, the Korean subjects tended to assign lower evaluations to 'Temple' scenes than the Chinese and...

### Table 2

| Groups          | Scenery       | No. |
|-----------------|---------------|-----|
| Artificial      |               |     |
| Shop            | Ebisu festival| 34  |
|                 | Honordi       | 36  |
|                 | Okonomi street| 5   |
| Factory         | Chigiri-shima | 38  |
|                 | Naka plant    | 40  |
| Modern Architecture | Peace museum | 11  |
|                 | Peace boulevard| 35  |
|                 | Night view    | 13  |
| Street          | Jouge town    | 9   |
|                 | Mitairai town | 32  |
|                 | Takedham town | 17  |
| Temple          | Butsuji temple| 12  |
|                 | Reika-dou     | 29  |
|                 | Botsuji (autumn) | 16  |
| Garden          | Shukkeien     | 19  |
|                 | Sanka-en      | 33  |
| Historical Architecture | Itsukushima shrine | 15  |
|                 | Hiroshima castle | 7   |
| Stones and Rocks | Setoda        | 21  |
|                 | Mt. Misen     | 30  |
| Valley          | Sandankyo     | 23  |
|                 | Taishaku      | 31  |
|                 | Kurobuchi     | 26  |
|                 | Rykou-zen     | 1   |
|                 | Mitairai      | 20  |
| Inland Sea 2    | Tatara bridge | 8   |
|                 | Mt. Kurotaki  | 37  |
|                 | Mt. Shirotaki | 39  |
|                 | Benten-jima   | 22  |
|                 | Onomichi      | 25  |
| Inland Sea 1    | Shinnyu lodge | 10  |
|                 | Rice field    | 28  |
|                 | Shinnyu (winter) | 18  |
|                 | Shinnyu (summer) | 27  |
| Mountain        | Kousan park   | 6   |
|                 | Kinata sunflower | 14  |
|                 | Bihoku park   | 2   |
|                 | Sera park     | 3   |
|                 | Innoshima     | 24  |

| 4-point scale  | Very Positive | +3 | Negative | -1 |
|----------------|---------------|----|----------|----|
| Positive       | +1            | Very Negative | -3 |

Fig.1. Image Evaluation Profile

The correlation coefficients between 'Hope to visit' and 'Similarity to Japan'

Korean 0.106  Chinese 0.370  Japanese 0.161
Japanese subjects. This is probably because 'Historical Architecture' scenes are highly characteristic of sightseeing scenes in Hiroshima while the subjects recognised the similarity between 'Temple' scenes in Japan and Korea. In contrast, several 'Artificial' scenes commonly received low responses. These scenes are believed to lack symbolic local features. Furthermore, the Japanese subjects appeared to rate 'Traditional' scenes and 'Valley' scenes higher than the Korean and Chinese subjects.

For Factor 2 ('Pleasantness'), the three subject groups provided high evaluations (13) for 'Historical Architecture', 'Garden' and 'Valley' scenes. 'Shop' and 'Factory' scenes received low evaluations.

For Factor 3 ('Traditionality'), the three subject groups did not show differences in their evaluation trends. 'Street', 'Temple', 'Valley', 'Mountain' and 'Flower' scenes were evaluated as traditional. Furthermore, the Japanese subjects provided low evaluations for 'Traditional' scenes, such as the 'Street' and 'Temple' scenes, which were generally evaluated highly by the Korean and Chinese subjects.

For Factor 4 ('Openness'), the three groups did not show much difference for Factor 4 ('Openness'); however, the Japanese subjects tended to evaluate 'Mountain' and 'Flower' scenes higher, and 'Artificial' scenes lower, than the Korean and Chinese subjects. This difference was significantly large for 'Modern Architecture' scenes, particularly (13) Hiroshima's night view.

4.3 Relation between Comprehensive and Image Evaluation

This section examines the mutual relation between evaluations of two items, 'Hope to visit' and 'Similarity to Japan', and the four factors obtained from the results of the SD technique image evaluation. The correlation coefficients for average evaluation scores of the two items and average factor scores of the four factors are shown in Table 3.

In 'Hope to visit', all subject groups, particularly the Korean subjects (with high scores for 'Inherency'), showed a high correlation between 'Inherency' and 'Pleasantness'. Moreover, in 'Openness' and 'Traditionality', a low correlation was observed for the Korean subjects. The Chinese and Japanese showed a high correlation for 'Openness' and 'Traditionality', respectively.

Meanwhile, the analysis of 'Similarity to Japan' indicated a trend different to the one above. One of the features of the Korean subjects' evaluations was a negative response to 'Openness', especially in traditional scenes, such as temple archways, castles and scenes of old towns. The Korean subjects identified narrow and enclosed scenes for 'Similarity to Japan'. Factors varied greatly in terms of subjects, namely 'Inherency', 'Openness' and 'Pleasantness' for the Chinese, Korean and Japanese subjects, respectively.
5. Connection between Physical Characteristics and Psychological Evaluation of Scenes

We will now examine the differences in evaluation between physical characteristics and psychological evaluation of scenes. The category score of each group's mean factor score, obtained by applying the quantification theory Type I, are shown in Fig.4., with explanatory variables split into 13 scene groups and external criteria divided into the four factors: 'Inherency', 'Pleasantness', 'Traditionality' and 'Openness'.

As opposed to the Chinese subjects, the Korean and Japanese subjects showed a negative value category score for 'Sea 2' in terms of the first factor, 'Inherency'. Moreover, only Japanese subjects provided a positive score for 'Valley'. Although all subject groups provided positive scores for 'Stones and rocks', Chinese respondents' scores were relatively low. Furthermore, only the Korean subjects evaluated 'Temple' negatively; the 'Temple' scenes were familiar to the Korean subjects due to similar scenes observed in Korea. In addition, 'Shops' received highly negative scores from the Japanese subjects only because of the prevalence of this scene category in Japan. From the above results, in terms of 'Inherency', it can be observed that different approaches to scene groups depend on the respondent's country of origin, which confirms the lack of consistency in evaluation criteria among subject groups.

In contrast, no major differences were observed among the subject groups with regard to 'Pleasantness', the second factor, or 'Traditionality', the third factor.
Finally, the fourth factor (‘Openness’) showed no major differences between the Korean and Chinese subjects, and both parties showed similar evaluation criteria for ‘Openness’. However, the values showed both positive and negative directions among Japanese subjects, as compared with the other two groups, especially for ‘Flowers’, ‘Mountains’, ‘Streets’, ‘Modern architecture’ and ‘Shops’. The tendency for evaluations to be determined on the basis of the scene group is estimated to be stronger among the Japanese subjects.

In summary, each scene group showed minor differences between subjects from different countries with regard to ‘Pleasantness’ and ‘Traditionality’, which confirms a common awareness. However, evaluations of scenes with respect to ‘Inherency’ and ‘Openness’ were approached differently, depending on the subject’s country of origin, primarily owing to the differences in common scenes depending on the subject’s home country. Scenes that are not encountered regularly tend to be evaluated as being more characteristic. A difference was also observed in commonality among subject groups in terms of their recognition of feelings of openness or confinement, which are thought to depend on the surrounding and upbringing environment of one’s home country.

6. Conclusion

Evaluation trends of Korean subjects regarding images of sightseeing scenes in Hiroshima Prefecture were compared to those among Chinese and Japanese subjects. The three main findings are described below.

(1) In evaluating ‘Similarity to Japan’, evaluations of Korean subjects depended on ‘Openness’ and ‘Traditionality’. They did not evaluate natural scenes as having a ‘Similarity to Japan’, which shows a major difference from the evaluations of Japanese subjects. The main reason for this is that the scenes presented for evaluation were those from Hiroshima Prefecture. Natural scenes of Hiroshima Prefecture are characterised by the Seto Inland Sea, with many small islands and the relatively gentle Chugoku Mountain range. These are similar to the natural landscape of Korea, characterised by many small islands and a few high mountains (the highest peak is Hallasan at 1,950 m). Evaluations were expected to differ for natural scenes across Japan, such as Mt. Fuji, and the iconic natural scenes of the great valleys.

(2) No correlation was observed between the evaluations of ‘Hope to visit’ and ‘Similarity to Japan’ among the Korean subjects, and their preferences were not influenced by evaluations of ‘Similarity to Japan’. ‘Inherency’ influenced preferences, and scenes with peculiar characteristics were evaluated as ‘Hope to visit’. When evaluating images of scenes from the present study, no extra information was provided regarding the location being a travel destination, such as through information on attractions in the surrounding area; therefore, only the image itself was evaluated. In this case, the evaluation criteria for ‘Hope to visit’ required ‘Inherency’, thereby providing a distinction from other images.

(3) Among the differences between Chinese and Korean evaluation trends, the Chinese group showed a stronger positive response to ‘Sea 2’ as ‘Hope to visit’, thus indicating their interest in the Seto Inland Sea, having features similar to a lake. Such scenes also received a high ‘Pleasantness’ evaluation. A characteristic among the Chinese subjects was the high level of correlation between ‘Hope to visit’ and ‘Pleasantness’. Although
night views and multiple beautiful islands were evaluated highly in terms of 'Pleasantness', the Korean group evaluated Japanese gardens and snowy mountains as pleasant, indicating a difference in awareness of pleasantness.

In many cases, sightseeing pamphlets promoting tourism to Korean people typically feature Japanese scenes. However, the present study revealed that depicting more characteristic scenes, such as gardens and snowy mountains, to Korean people was more effective. Moreover, natural scenes clearly do not evoke a feeling of 'Similarity to Japan' for Korean people; therefore, highlighting characteristic scenes that match the evaluation characteristics of Korean people rather than highlighting 'Similarity to Japan' is important to attract tourists from Korea.

Finally, we will discuss possible future research based on the results of the present study. In this study, a psychological evaluation experiment was conducted using images of characteristic sightseeing scenes in the Hiroshima area, which were sourced from the Hiroshima Prefecture website. However, the characteristic sightseeing resources in other regions in Japan differ from those in Hiroshima, and more versatile results are likely to be obtained by targeting those resources. Moreover, foreign students' degree of knowledge and experiences of Japan also influence the evaluation; therefore, an additional issue for the future is how evaluations are expected to improve among Chinese students who have no experience of living in Japan, especially considering their level of knowledge and education.

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