

Statistical Classification of Visitors to Hot Spring Resorts

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ABSTRACT

It is important to statistically understand characteristics of visitors to hot-spring resorts to provide appropriate services. We therefore developed a measurement scale for statistical group type classification of visitors. The paper describes scale-making process and the effect of scale. We implemented Web Questionnaire Survey for 402 people in Japan about their behavior toward and involvement in trips to spa resorts. As a result of study with Factor Analysis and Cluster Analysis, we classified people into 6 group types. We simultaneously extracted 11 Distinctive Questions that were valid in classifying people according to the context of use and the tendency in consuming trips to spa resorts. Moreover, we developed the logic for Group Typing of the respondent by asking only these 11 distinctive questions. As a result of another survey, 80% of all participants evaluated the validity. The scale is applicable to optimizing appropriate services there and recommendations by travel agency.

Key words: questionnaire survey, hot spring resorts, scale-making, statistical analysis.

INTRODUCTION

It is the key information such as what kinds of tourists, how, and for what reasons in order to satisfy them by providing optimum services. Knowledge based on these actual conditions enables us to provide appropriate information and services for visitors to hot-spring resorts, and can be tips to design appropriate

services. It is important to understand the context of use and therefore, it depends on whether or not we can ask respondents appropriate questions about their behavior and involvement. Generally, indexes such as age, gender, living place, annual income, history or frequency of travel are often used in order to look at characteristics of tourists. However, these are not always useful to comprehend the actual condition of tourists. For instance, age or gender can be one of indexes that project travel history and preference of someone indirectly. At the same time, it sometimes projects completely the opposite from stereotyped image. The quality of empirical value of travel depends on how much one involves in making plans voluntarily by the same token. In addition, it never can be enough to identify the characteristics of tourists by only history or frequency of travel. And so, it is necessary to have such indexes which enable us to ask the quality of experience or the preference in trips to spa resorts based on not only demographic or geographic but also psychological or behavioral data. We therefore developed the scale to classify visitors to hot-spring resorts to understand behavior toward and involvement in trips to hot-spring resorts in a more concrete way

OBJECTIVES

There are about 3100 hot-spring resorts in Japan. Hot spring trip is one of the familiar and popular leisure activities for Japanese. Each resort is unique in its own way and varies in style from hot spring cure or recreation to large-scale or leisure-conscious one benefited from rich tourist resources in the surroundings. In addition to this, the style in trips to spa resorts these days has been accomplished some changes from one collective or recreational to something personal or for enjoyment according to the diversification of Japanese lifestyle. As a result, while many famous large-scale resorts become old-fashioned, some small start-up resorts gain popularity by providing services suited to these times. Good information and strategy can help their business to attract people since there is a paradigm shift in the business field of hot-spring resorts. At the same time, it is the fact that many of resorts still remain to provide traditional services relying on experience or wits. We therefore developed a scale to identify the characteristics of visitors to hot-spring resorts which can be applicable to redesign and provide evidence-based services in stead of the one old-fashioned based on experiences and wits of someone. This scale enables us to research correlative relationship between behavior and involvement of hot-spring visitors, and is therefore applicable to provide appropriate services.

In this paper, we describe the process of making the scale as shown below in Figure 1 to classify people based on the way they communicate with hot-spring resorts, the usability and the future application.

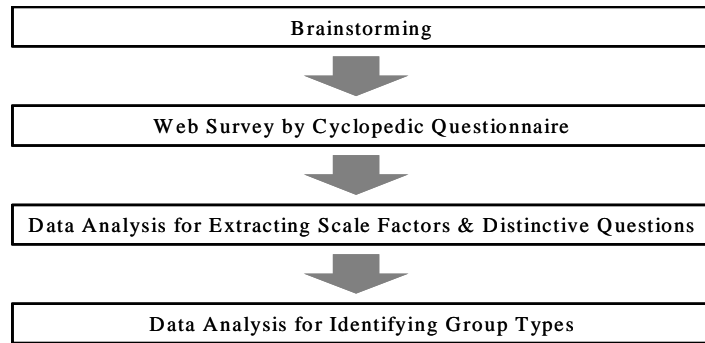


Figure 1. Process of Scale-making

Process of Scale-making

Brainstorming

We focused attention on diversity in hot-spring visitors when making the scale, and did some brainstorming about sense of value and preference in choosing a spa resort, also literacy, behavior and involvement about hot-spring trip. For example, "One who knows well about hot springs must be particular about ingredients and the effect.", "One interested in other than taking the water must select resorts locating in a neighborhood of sightseeing spot.", "There are scheduled and not scheduled." and so on. This time, 4 experts in the research of hot-spring trips at U'eyes Design Inc. did some brainstorming and extracted about 130 cyclopedic questions as candidates for the scale.

Web Survey by Cyclopedic Questionnaire

We then extracted 94 cyclopedic questions by integrating similarities among 130 candidates and modified them into Web Questionnaire style while doing brainstorming. Respondents answered about the degree of agreement for each question in 4 levels: Agree as 4 – Partly agree as 3 – Slightly agree as 2 – Disagree as 1. We then carried out Web Questionnaire Survey for 402 people throughout Japan. There were 174 men and 228 women, and the average age was 42.5.

Data Analysis for Extracting Scale Factors and Distinctive Questions

The data obtained from the Web Survey by Cyclopedic Questionnaire was processed with Varimax Rotation of Factor Analysis. We adopted 11 factors as shown in below Table 1, which was simple and clear in structure, out of 21 factors extracted with the above statistical data analysis. The cumulative contribution ratio of these 11 factors was 38.6%. Finally, we selected one question out of others in every factor group and defined as the distinctive question which had the highest factor loading essentially. These 11 distinctive questions were extracted as the scale to classify people based on the way they communicated with hot-spring resorts as shown in below Table 2.

Table 1. Interpretation of Factor

Factor No.	Interpretation
1	Taste / Atmosphere-Oriented
2	Particular about Hot spring and Quality of Water
3	Take the Water Time and Again
4	Large Scale / Amusement
5	Shopping
6	Special / Luxury
7	Impulsive / Whim
8	Be Taken for
9	Information Gathering
10	Carefree
11	As Planned

Table 2. Distinctive Questions

Factor No.	Distinctive Question
1	I'd like to look around the surroundings.
2	I think I have some knowledge of the water and benefit of it.
3	I'd rather take the water many times during a stay.
4	I'd like to visit theme parks if there are some nearby hot spring resorts.
5	Souvenir is one of the importance and something to enjoy.
6	I'd rather expect enhanced services and hospitality at classy accommodations.
7	I'd rather enjoy looking for information while traveling than doing it in advance.
8	It is not me but someone who plans trips to hot-spring resorts.
9	I'd rather refer to information such as ranking or grapevine on Web or other media
10	I'd rather prefer staying carefree in the room than going outside.
11	I'd like to make such a schedule as a time to arrive or a place to eat in detail.

Data Analysis for Identifying Group Types

We created the matrix of the data derived from 402 responders using the scale consisted of 11 distinctive questions and processed the mean and the standard deviation for each distinctive question. The cobweb chart in Fig.2 indicates the image of average Japanese visitors to hot springs resorts.

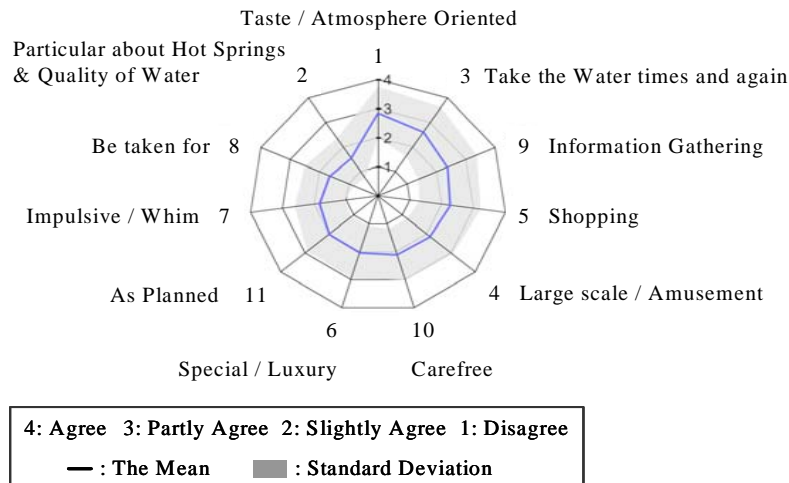


Figure 2. Mean and Standard Deviation of the Total

We then statistically processed the matrix of the data with cluster analysis (Ward Method, Squared Euclidean Distance). It enabled us to classify visitors to hot-spring resorts into 6 group types from G1 to G6. Each of 6 cobweb charts in Fig.3 indicates the mean and the standard deviation for each group type. In the following section, we are going to explain the characteristics of each group type extracted by the scale, based on the mean of each group type.

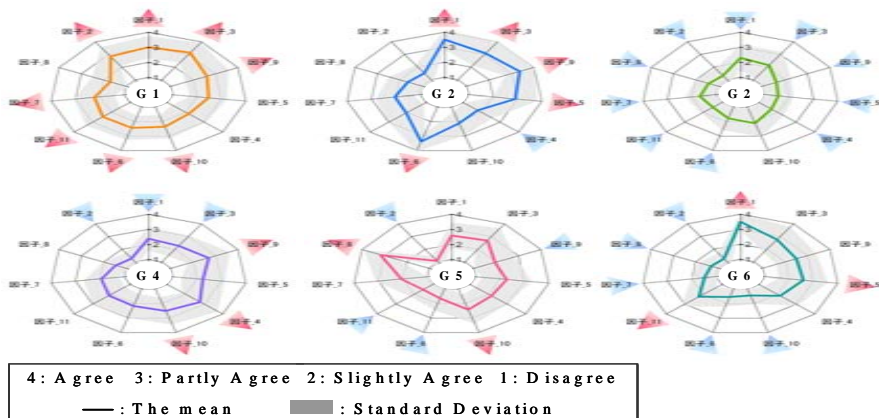


Figure 3. Mean and Standard Deviation of Each Group Type

CONSIDERATION OF THE SCALE

Characteristics of G1

G1 group type tends to be fond of hot spring itself and take the water many times while staying a resort based on the mean of the G1 cobweb chart as shown in Fig. 3. They share a common habit such as obtaining some knowledge in the quality of water, making an effort to gather some information and being well-planned during a trip. In addition, they are particular about taste and atmosphere and tend to expect to enjoy luxury at accommodations. G1 group type accounts for 16.9% of the total. The percentage of men in G1 is higher compared to that of the rest.

Characteristics of G2

G2 group type is more likely to do attach importance to enhanced services or hospitality of classy accommodations and expect to enjoy a special touch of luxury based on the mean of the G2 cobweb chart as shown in Fig.3. Also, they take the water many times in various styles while enjoying taste and atmosphere there. They collect information actively and are very interested in shopping around, for example, souvenirs. G2 group type accounts for 8.2% of the total which is the smallest, and has a higher percentage of women compared to the rest. There are more women in their 30s as well as men in their 50s based on age and gender.

Characteristics of G3

G3 group type has neither any special interest nor persistence toward hot-spring trips based on the mean of the G3 cobweb chart as shown in Fig.3. They are reluctant to collect information. They tend to stay rather whim and carefree in their own pace. G3 accounts for 21.6% and occupies a relatively large portion of the total. There are more men in 60s based on age and gender.

Characteristics of G4

G4 group type tends to show a lack of interest in hot springs, taste and atmosphere based on the mean of the G4 cobweb chart as shown in Fig.3. They tend to show high interest to amusement services such as theme parks or large premises in the surroundings. G4 accounts for 19.2% of the total and there are more young people. There is dominated by men and women in their 20s.

Characteristics of G5

G5 group type is rather taken for hot-spring resorts by others based on the mean of the G5 cobweb chart as shown in Fig.3. G5 accounts for 10.2% of the total. G5 has more women than men compared to the rest. Also, there are more women in 40s based on both age and gender.

Characteristics of G6

G6 group type puts an importance on taste or atmosphere of hot-spring resorts and usually makes as well as follows a schedule based on the mean of the G6 cobweb chart as shown in Fig.3. They are interested in looking and shopping around souvenirs. G6 accounts for 23.9% and is the largest group type of the total. There is not bias in gender, but there is somewhat more women in 50s based on both age and gender.

Image of Japanese Visitors to Hot-Spring Resorts

According to the above analysis, G1 and G2 group types are both independent as tourists and the most particular about hot spring itself. These 2 group types combined together are 25.1% of the total. On the other hand, there are 31.8% of followers who are dependent and passive like G3 and G5 group types. They consider trips to hot-spring resorts as the consuming activity for their family, friend or acquaintance. It infers that there are many visitors who are passive and subordinate in trips to hot-spring resorts expect for someone who makes a plan. In addition, 43.1% visitors, like G4 and G6, prefer taste, atmosphere, sightseeing resources in the surroundings or tourist facilities than hot-springs and are the largest group type of the total.

This is the logic for Group typing, that is, the way of identifying a group type of the respondent. Assumed that the distribution of the scale of 1-to-4 is $N(\mu, \sigma^2)$, the formula below is the way to calculate Self-information of the scale of $X \{X=1,2,3,4\}$ that the respondent answers.

$$I(X_{ij}) = -\log_2 P(X_{ij})$$

$P(X_{ij})$ indicates the establishment in an area that the scale of X takes regarding the question "j" for group type "i". It is what Shannon entropy is applied to Probability Density Function. The higher the probability $P(X_{ij})$ of the scale becomes, the smaller the Self-information becomes, and it indicates a high goodness of fit. We then calculate $I(S_i)$ as summation of Self-information that each question owns per group type. At last, we classify the respondent into the group type "i" which indicates the smallest value of $I(S_i)$.

CONCLUSION

In this study, we identified 6 group types of Japanese visitors to hot-spring resorts by making a scale which enabled us to classify people based on psychographic and behavioral variables in trips to hot-spring resorts. We also developed the logic for Group Typing by using the scale. We are planning to carry out field survey or interview research of purpose for visitors who are broke down by the scale in order to derive involvement of each group type with activities during actual trips as well as customer satisfaction measurement. We eventually acquire some knowledge in order to apply to design and optimize services within hot-spring resorts.