Multivariate Analysis for the Questionnaire Investigation on the Needs at Fuji City

Yuki Higuchi¹, Akane Okubo², Daisuke Suzuki³ & Kazuhiro Takeyasu⁴

¹Faculty of Business Administration, Setsunan University, Japan
²Nihon University Junior College, Japan
³Fujisan Area Management Company, Japan
⁴College of Business Administration, Tokoha University, Japan

Correspondence: Kazuhiro Takeyasu, College of Business Administration, Tokoha University, Japan.

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Abstract

Shopping streets at local city in Japan became old and are generally declining. In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Four big festivals are held at Fuji city (two for Fuji Shopping Street Town and two for Yoshiwara Shopping Street Town). Many people visit these festivals including residents in that area. Therefore a questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors’ needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. These are analyzed by using Multiple Correspondence Analysis. These are utilized for constructing a much more effective and useful plan building. We have obtained fruitful results. To confirm the findings by utilizing the new consecutive visiting records would be the future works to be investigated.

Keywords: Fuji city, area rebirth, regional vitalization, festival, multiple correspondence analysis

1. Introduction

Shopping streets at local city in Japan are generally declining. It is because most of them were built in the so-called “High Growth Period (1954-1973)”. Therefore they became old and area rebirth and/or regional revitalization are required everywhere.

There are many papers published concerning area rebirth or regional revitalization. Inoue (2017) has pointed out the importance of tourism promotion. Ingu et al.(2017) developed the project of shutter art to Wakkanai Chuo shopping street in Hokkaido, Japan. Ohkubo (2017) has made a questionnaire research at Jigenji shopping street in Kagoshima Prefecture, Japan and analyzed the current condition and future issues. For about tourism, many papers are presented from many aspects as follows.

Yoshida et al. designed and conducted a visitor survey on the spot, which used a questionnaire to investigate the activities of visitors to the Ueno district in Taito ward, Tokyo. Doi et al. analyzed the image of the Izu Peninsula as a tourist destination in their 2003 study “Questionnaire Survey on the Izu Peninsula.” Kano conducted tourist behavior studies in Atami city in 2008, 2009, 2014 and in other years.

In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Fuji city is located in Shizuoka Prefecture. Mt. Fuji is very famous all around the world and we can see its beautiful scenery from Fuji city, which is at the foot of Mt. Fuji. There are two big shopping street in Fuji city. One is Yoshiwara shopping street and another one is Fuji shopping street. They became old and building area rebirth and regional revitalization plan have started. Following investigation was conducted by the joint research group (Fuji Chamber of Commerce & Industry, Fujisan Area Management Company, Katsumata Maruyama Architects, Kougakuin University and Tokoha University). The main project activities are as follows.

A. Investigation on the assets which are not in active use
B. Questionnaire Investigation to Entrepreneur
C. Questionnaire Investigation to the residents and visitors

After that, area rebirth and regional revitalization plan were built. In this paper, we handle above stated C.

Four big festivals are held at Fuji city. Two big festivals are held at Yoshiwara Shopping Street Town and two big festivals at Fuji Shopping Street Town. At Yoshiwara Shopping Street Town, Yoshiwara Gion Festival is carried out during June and Yoshiwara Shukuba (post-town) Festival is held during October. On the other hand, Kinoene Summer Festival is conducted during August and Kinoene Autumn Festival is performed during October at Fuji Shopping Street Town. Many people visit these festivals including residents in that area. Therefore questionnaire investigation of C is conducted during these periods.

Finally, we have obtained 982 sheets (Yoshiwara Shopping Street Town: 448, Fuji Shopping Street Town: 534). Basic statistical analysis and Multiple Correspondence analysis are executed based on that.

In this paper, a questionnaire investigation is executed in order to clarify residents and visitors’ needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. Such multivariate analysis as Multiple Correspondence Analysis is executed based on that. Some interesting and instructive results were obtained.

The rest of the paper is organized as follows. Outline of questionnaire investigation is stated in section 2. In section 3, Multiple Correspondence Analysis is executed which is followed by the Remarks stated in section 4.

2. Outline and the Basic Statistical Results of the Questionnaire Research

2.1 Outline of the Questionnaire Research

A questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors’ needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. The outline of questionnaire research is as follows. Questionnaire sheet is attached in Appendix.

(1) Scope of investigation : Residents and visitors who have visited four big festivals at Fuji city in Shizuoka Prefecture, Japan
(2) Period : Yoshiwara Gion Festival: June 11,12/2016
Yoshiwara Shukuba (post-town) Festival: October 9/2016
Kinoene Summer Festival: August 6,7/2016
Kinoene Autumn Festival: October 15,16/2016
(3) Method : Local site, Dispatch sheet, Self writing
(4) Collection : Number of distribution 1400
Number of collection 982(collection rate 70.1%)
Valid answer 982

2.2 Basic Statistical Results

Now, we show the main summary results by single variable.

(1). Sex (Q7)
Male 48.9%, Female 51.1%
These are exhibited in Figure 1.
(2). Age (Q8)
10th 16.2%, 20th 14.8%, 30th 22.4%, 40th 17.4%, 50th 11.6%, 60th 10.5%, More than 70 7.1%
These are exhibited in Figure 2.

(3) Residence (Q9)
a. Fuji city 56.4%, b. Fujinomiya city 18.0%, c. Numazu city 7.2%, d. Mishima city 2.3%, e. Shizuoka city 4.2%, F. Else (in Shizuoka Prefecture) 5.1%, g. Outside of Shizuoka Prefecture 6.9%
These are exhibited in Figure 3.
(4). How often do you come to this shopping street? (Q1)

Everyday 17.4%, More than 1 time a week 16.5%, More than 1 time a month 25.8%, More than 1 time a year 31.6%, First time 4%, Not filled in 4.8%

These are exhibited in Figure 4.

(5). What is the purpose of visiting here? (Q2)

Shopping 18.8%, Eating and drinking 13.4%, Business 7.4%, Celebration, event 40.2%, Leisure, amusement 4.0%, miscellaneous 16.1%

These are exhibited in Figure 5.
(6). How do you feel about the image of the surrounding area at this shopping street? (Q3)
These are exhibited in Figure 6.

Figure 5. What is the purpose of visiting here? (Q2)

Figure 6. How do you feel about the image of the surrounding area at this shopping street? (Q3)
There are many old building at the age of nearly 50 years. Do you think we can still use them? (Q4)
Can use it 44.1%, Cannot use it 31.4%, Have no idea 24.5%
These are exhibited in Figure 7.

3. Multiple Correspondence Analysis
Now, we execute the Multiple Correspondence Analysis. We made the following analysis.

Q3: “How do you feel about the image of the surrounding area at this shopping street?”
We can observe the following result from Table 1. From the data, Cronbach’α is 0.859 in dimension 1 and 0.692 in dimension 2. Therefore it can be said that the data are reliable.

Table 1. Summary of the model

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Cronbach’α</th>
<th>Variance explained</th>
<th>Total (eigenvalue)</th>
<th>Inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.859</td>
<td>5.125</td>
<td>0.320</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.692</td>
<td>2.848</td>
<td>0.178</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7.973</td>
<td>0.498</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>.799</td>
<td>3.987</td>
<td>0.249</td>
<td></td>
</tr>
</tbody>
</table>

a.Average of Cronbach’α is calculated based upon the average of eigenvalue.

Next, Discrimination Measurement for Q3 is exhibited in Figure 8.
Next, plot of link in categorical point for Q3 is exhibited in Figure 9. Here following abbreviation is used.

- Y-Fascinating: Think so
- N- Fascinating: Do not think so
- E- Fascinating: Else
From Figure 9, we can observe three big clusters. One is an affirmative group, and another one is a negative group and the last one is the else one. These are clearly divided.

We focus the affirmative group. There are following 4 clusters included.

- Left side: It is a single item group of “Y- Full of nature”.
- Right lower: It is a single item group of “Y- Atmosphere of urban”.
- Center: It consists of “Y-Warm”, “Y-Want to reside”, “Y- Friendly” and “Y-Healed”, which means “Heart-easing with andante cantabile”.

As the center right is a major group part, we focus this point under the cross relationship with Q2: “What is the purpose of visiting here?”

Q2: “What is the purpose of visiting here?”


We can observe the following result from Table 2. From the data, Cronbach’ $\alpha$ is 0.778 in dimension 1 and 0.544 in dimension 2. Therefore it can be said that the data are rather reliable.

Table 2. Summary of the model

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Cronbach’ $\alpha$</th>
<th>Variance explained</th>
<th>Inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (eigenvalue)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.778</td>
<td>3.598</td>
<td>0.257</td>
</tr>
<tr>
<td>2</td>
<td>0.544</td>
<td>2.022</td>
<td>0.144</td>
</tr>
<tr>
<td>Total</td>
<td>5.620</td>
<td>0.401</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>0.694a</td>
<td>2.810</td>
<td>0.201</td>
</tr>
</tbody>
</table>

a. Average of Cronbach’ $\alpha$ is calculated based upon the average of eigenvalue.

Next, Discrimination Measurement for Q2 and Q3 is exhibited in Figure 10.
Figure 10. Discrimination measurement for Q2 and Q3

Next, plot of link in categorical point for Q2 and Q3 is exhibited in Figure 11. The abbreviation is the same with above.

Figure 11. Plot of link in categorical point for Q2 and Q3
From Figure 11, we can observe the following six clusters.

- **Center Upper**: It is a single item group of “Y-Business”.
- **Center Right**: “Y-Lively”, “Y-New”, “Y-Fascinating”, “Y-Want to play”, “Y-Varied”, “Y-Individualistic”, “Y-Cheerful”, “Y-Beautiful” and “Y-Of the united feeling there is” which means “Positive vivace”.
- **Center**: Affirmative one and Negative one are included. We pick up affirmative one. “Y-Shopping”, “Y-Eating and drinking”, “Y-Celebration, event”, which are the items of the purpose of visiting.
- **Center lower**: It is a single item group of “Y-Leisure, amusement”.
- **Left**: Negative group
- **Upper**: Else

### 4. Remarks

The Results for Multiple Correspondence Analysis are as follows. From Figure 9, we can observe three big clusters. One is an affirmative group, and another one is a negative group and the last one is the else one. These are clearly divided.

We focus the affirmative group. There are following 5 clusters included.

- **Left side (A)**: It consists of “Y-Full of nature” and “Y-Friendly”, which means “Natural and Approachable”.
- **Right upper (B)**: It is a single item group of “Y-Airmosphere of urban”.
- **Right lower (C)**: It consists of “Y-New”, “Y-Beautiful” and “Y-Individualistic”, which means “Sophisticated”.
- **Center (D)**: It consists of “Y-Warm” and “Y-Healed”, which means “Heart-easing”.
- **Center right (E)**: It consists of “Y-Varied”, “Y-Cheerful”, “Y-Open”, “Y-Lively”, “Y-Want to play”, “Y-Fascinating”, “Y-Want to reside” and “Y-Airmosphere of urban”, which means “Positive vivace”.

Cluster (A) is close to the Negative cluster which is in the left. Cluster (B) is far away from the Negative cluster and the Else cluster. Cluster (D) lies between cluster (A) and cluster (E). It is somewhat similar to the results of the Bayesian Network Analysis we have done before.

From Figure 11, we can observe the following six clusters.

- **Center Upper (F)**: It is a single item group of “Y-Business”.
- **Center Right (G)**: “Y-Lively”, “Y-New”, “Y-Fascinating”, “Y-Want to play”, “Y-Varied”, “Y-Individualistic”, “Y-Cheerful”, “Y-Beautiful” and “Y-Of the united feeling there is” which means “Positive vivace”.
- **Center (H)**: Affirmative one and Negative one are included. We pick up affirmative one.
  “Y-Shopping”, “Y-Eating and drinking”, “Y-Celebration, event”, which are the items of the purpose of visiting.
- **Center lower (I)**: It is a single item group of “Y-Leisure, amusement”.
- **Left (J)**: Negative group
- **Upper (K)**: Else

Cluster (H) have both of the affirmative and negative items and is also close to the Negative cluster which is in the left.

Cluster (I) is far away from the Negative cluster and the Else cluster and is rather close to the Affirmative cluster.

Cluster (F) is far away from the Affirmative cluster and the Negative cluster and is close to the Else cluster. It is somewhat similar to the results of the Bayesian Network Analysis we have done before.

In order to make the street town much more attractive, the above results should be taken into account.

### 5. Conclusion

Shopping streets at local city in Japan became old and are generally declining. In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Four big festivals are held at Fuji city (two for Fuji Shopping Street Town and two for Yoshiwara Shopping Street Town). Many people visit these festivals including residents in that area. A questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors’ needs for the shopping street and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. These are analyzed by using Multiple Correspondence
Analysis.

The Results for Multiple Correspondence Analysis are as follows.

Cluster (A) is close to the Negative cluster which is in the left. Cluster (B) is far away from the Negative cluster and the Else cluster. Cluster (D) lies between cluster (A) and cluster (E). Cluster (H) have both of the affirmative and negative items and is also close to the Negative cluster which is in the left. Cluster (I) is far away from the Negative cluster and the Else cluster and is rather close to the Affirmative cluster. Cluster (F) is far away from the Affirmative cluster and the Negative cluster and is close to the Else cluster. It is somewhat similar to the results of the Bayesian Network Analysis we have done before. In order to make the street town much more attractive, the above results should be taken into account.

These are utilized for constructing a much more effective and useful plan building. Although it has a limitation that it is restricted in the number of research, we could obtain the fruitful results. To confirm the findings by utilizing the new consecutive visiting records would be the future works to be investigated.

Acknowledgements

The authors are grateful to all those who supported us for answering the questionnaire investigation.

References


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Appendix: Questionnaire Sheet about the Image Around the Shopping Street

1. How often do you come to this shopping street?
a. Everyday  b. (   ) times a week  c. (   ) times a month  d. (   ) times a year
   e. miscellaneous (   )

2. What is the purpose of visiting here? (Plural answers allowed)
a. shopping  b. eating and drinking  c. business  d. celebration, event  e. leisure, amusement
   f. miscellaneous (   )

3. How do you feel about the image of the surrounding area at this shopping street?
Select the position

<table>
<thead>
<tr>
<th>Beautiful</th>
<th>Ugly</th>
<th>Of the united feeling</th>
<th>Scattered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varied</td>
<td>Featureless</td>
<td>New</td>
<td>Historic</td>
</tr>
<tr>
<td>Full of nature</td>
<td>Urban</td>
<td>Cheerful</td>
<td>Gloomy</td>
</tr>
<tr>
<td>Individualistic</td>
<td>Conventional</td>
<td>Friendly</td>
<td>Unfriendly</td>
</tr>
<tr>
<td>Healed</td>
<td>Stimulated</td>
<td>Open</td>
<td>exclusive</td>
</tr>
<tr>
<td>Want to reside</td>
<td>Do not want to reside</td>
<td>Warm</td>
<td>Aloof</td>
</tr>
<tr>
<td>Want to play</td>
<td>Not fascinating</td>
<td>Fascinating</td>
<td>Not fascinating</td>
</tr>
<tr>
<td>Lively</td>
<td>Calm</td>
<td>Atmosphere of urban</td>
<td>Atmosphere of rural area</td>
</tr>
</tbody>
</table>

4. There are many old building at the age of nearly 50 years. Do you think we can still use them?
   a. Can use it   b. Cannot use it   C. Have no idea

5. Is there any functions or facilities that will be useful?

6. Comments

7. Sex
   a. Male   b. Female

8. Age
   a. 10th   b. 20th   c. 30th   d. 40th   e. 50th   f. 6th   g. More than 70

9. Residence
   a. Fuji City   b. Fujinomiya City   c. Numazu City   d. Mishima City   e. Shizuoka City   f. Miscellaneous in Shizuoka Prefecture   g. Outside of Shizuoka Prefecture