

■ 論 文 ■

Data Analysis of the AsiaBarometer Survey: Well-being, Trust and Political Attitudes

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1 Introduction

The standard practice in the data analysis of cross-national surveys is to start with comparisons of frequency distribution of each question item and then to move on to comparisons of the patterns in the relationships between question items. This is conducive to the application of various methods of multivariate analysis. In such cases, however, certain preparatory analysis needs to be done. The preparatory analysis of seeking out a direction for the analysis might be considered a form of “exploratory data analysis.” In survey data analysis, researchers first look at the overall structure and relationships between the data, and then try to conduct a deeper level of analysis by focusing on a particular aspect of the data. In this study, I conduct a Smallest Space Analysis (SSA) based on a matrix of Guttman’s Weak Monotonicity Coefficient that shows the relationships between question items. The coefficients indicate the similarity or dissimilarity between the items of the matrix. The higher the coefficient, the greater the similarity. I have selected SSA because it appears to be a useful method for the understanding of the structure of data.

As a type of multidimensional scaling, SSA is a nonmetric method of expressing the relationship between n number of question items shown in a coefficient matrix by the size of the distance between n points in an m -dimensional ($m < n$) space. The higher the coefficient, the smaller the distance, and the lower the coefficient the smaller the distance. Usually a 2-dimensional (plane) or 3-dimensional (cube) space is used to visually depict the relationship between question items (for the algorithm and software of SSA, see Appendix).

The goodness-of-fit of the SSA diagram to the coefficient matrix is indicated in the Shepard Diagram and the Coefficient of Alienation (Amar and Toledano, 2001). It is confirmed that in the SSA maps below alienation coefficients are all less than 0.15, and are satisfactory.

This method of analysis is likely to be applicable as a very effective tool in examining

equivalence of measurement, a major concern when conducting cross-national surveys. In a cross-national survey that uses the same wording for the same question items can yield an SSA map showing the similar spatial structure, it is highly likely that “commonality of meaning” can likewise be established in those countries. Thus, it is highly likely that the equivalence of measurement can be ensured. This is an important reason for using SSA (for the further discussion, see Borg, 1998).

2 Result of Data Analysis

2.1 Well-Being

The 19 question items compiled under the heading of “well-being” include one item related to feelings of happiness (Q 4), one item related to feelings of life enjoyment (Q 5), one item related to feelings of accomplishment (Q 6), and 16 items related to life satisfaction (Q 7 a–p) (for the literature review of the research on well-being, see Robinson, Shaver and Wrightsman, 1991).

When examining the SSA maps (Figure 1) for six countries, one can focus on either (1) the commonalities evident in six countries’ SSA maps, or (2) the differences evident in six countries’ SSA maps. There are several commonalities evident in the SSA maps of six countries (Vietnam is excluded from this data analysis, as some of the question items were not included on the country’s survey), three of which are discussed below.

1) The first is the positions of four items: public safety (13), the environment (14), social welfare system (15), and the democratic system (16). Among the questions asked regarding life satisfaction, these four were slightly different in terms of their content than the others. While the other question items tend to address more “personal issues,” these four tend to address more “institutional issues.” If we turn our attention to the SSA maps, these four items comprise a single independent space in all of the countries.

2) Another is that there are two types of character-defining question items that belong in the “personal issues” category: instrumental items, such as household income (8) and standard of living (7), and consummatory items, such as marriage (6) and family life (17). If we look at the SSA map, we can see a broadening pattern of the special structure of the instrumental item cluster on the one hand, and the consummatory item cluster on the other.

3) Finally, the questions “Do you feel happy?” “Do you enjoy your life?” and “Do you have a sense of accomplishment?” are located in separate area set apart from the 16 items regarding “life satisfaction” for each country. This suggests that the hypothesis to make a conceptual distinction between these three items as “question items on happiness,” and the “question items on life satisfaction,” was, indeed, appropriate.

What are the differences between the countries? As is shown in the three findings above, the

19 question items addressed in this data analysis could be divided into three major groupings in each country examined (this leads to the generalizable proposition about the equivalence of the “linkage of meanings” with regard to these items), but there were differences in each country with regard to the spatial structure of the items within those groupings. To determine where these national differences come from would require an investigation of the various economic, political, social, and cultural conditions in each country.

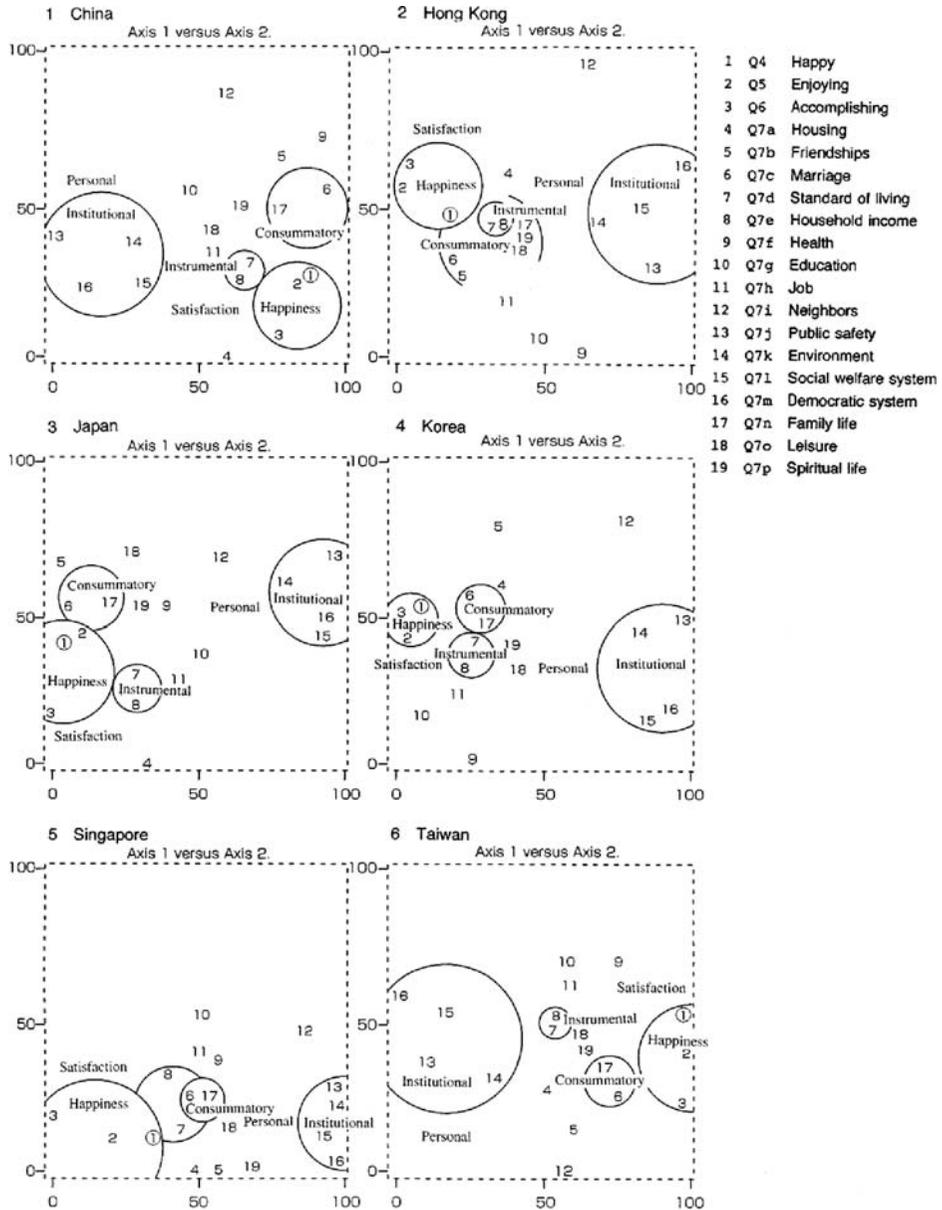


Figure 1 Smallest Space Analysis of the Interrelations among Well-being Items

2. 2 Trust

The 21 question items group addressed in this data analysis is divided into three items on “interpersonal trust” (Q 11, Q 12, and Q 13) and 19 items on “institutional trust” (Q 29 a–s). The items regarding interpersonal trust ask “Generally, do you think people can be trusted or do you think that you can’t be too careful in dealing with people?” (Q 11), “Do you think that people generally try to be helpful or do you think that they mostly look out for themselves?” (Q 12), and “If you saw somebody on the street looking lost, would you stop to help?” (Q 13). The items regarding institutional trust ask if the respondent trusts 19 institutions, systems, and or-

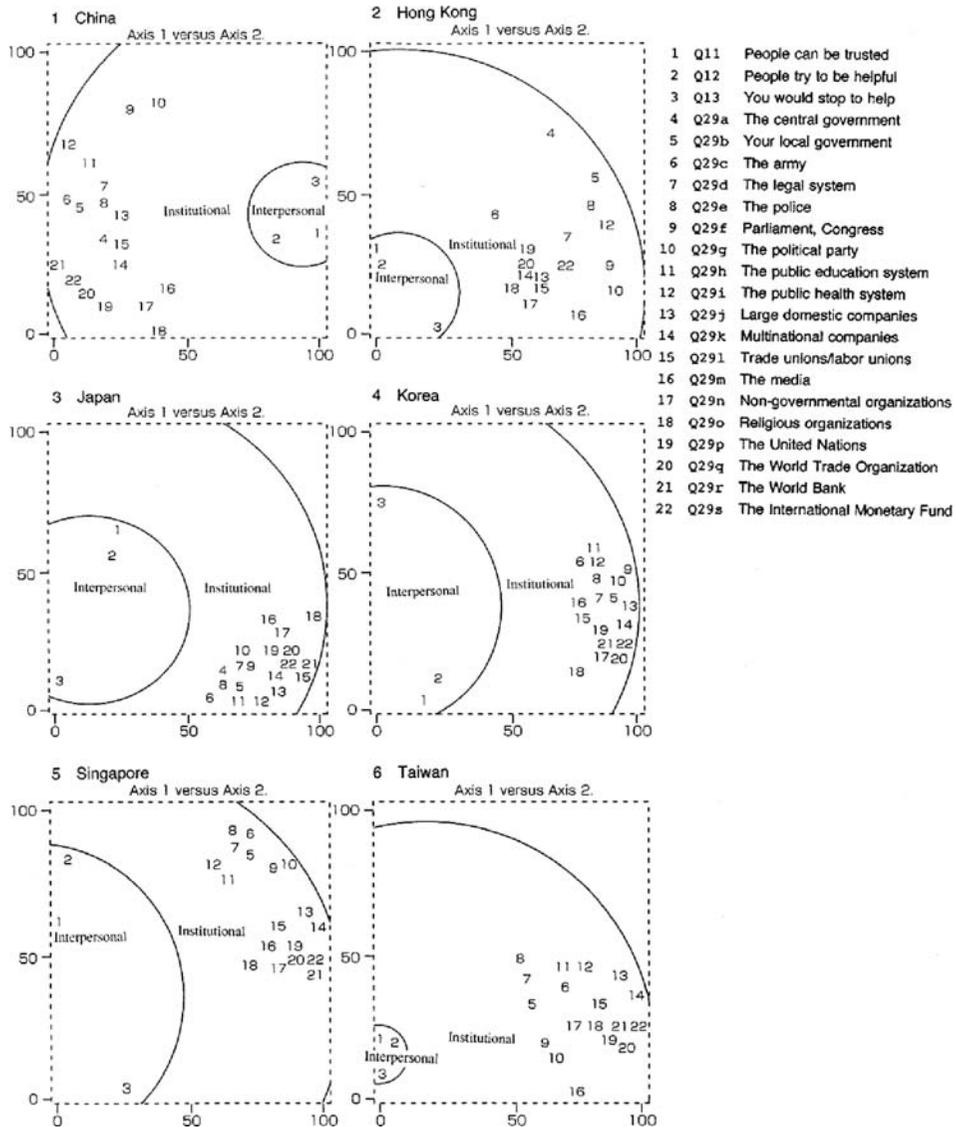


Figure 2 Smallest Space Analysis of the Interrelations among Trust Items

ganizations, such as “the central government,” “the local government,” “the army,” “the legal system,” “the police,” “parliament” and so on (Q 29).

Here again, I have obtained the six 2D maps using SSA (Figure 2).

The commonalities between the countries are quite remarkable. The questions related to people’s social trust are shown in concentric circles in six countries. Questions 1, 2, and 3 on interpersonal trust are located in the inner concentric circle, while questions 4–22 on institutional trust are positioned in the outer concentric circle. In other words, there tends to be a consistent discrepancy between interpersonal trust and institutional trust (specifically, for example, the attitudinal tendency to say “I trust people,” but “I don’t trust institutions”) across the countries.

This is not to say that there are no differences between six countries. While the discrepancy between the two types of trust is common in six countries, the size of that discrepancy varies in six nations.

Active debates around the theme of “trust” as it is addressed here have evolved over the past decades. Francis Fukuyama, one of the scholars of this academic field, makes an analytical argument in his book *Trust: The Social Virtues and the Creation of Prosperity* (NY: Free Press, 1995) regarding the relationship between the way social structures are created in various countries and the people’s sense of trust. The generalizable proposition suggested above is believed to further contribute to the development of Fukuyama’s argument.

2. 3 Political Attitudes

The AsiaBarometer survey contains several questions created for the purpose of measuring people’s political attitudes. For the purpose of this data analysis, I examine seven questions, Q 34 a–g. These question items have been used in various political attitude surveys conducted since G. A. Almond and S. Verba, *The Civic Culture: Political Attitudes and Democracy in Five Nations* (Princeton: Princeton University Press, 1963). Once again, I begin by examining the meaning of these questions. A careful examination of the meaning of each question reveals that these seven question items can be divided into three groups: (a) items regarding political duty (1), (b) items regarding political cynicism (2, 6, 7), and (c) items regarding political efficacy (3, 4, 5). The purpose of this data analysis is to verify whether this classification is applicable in a cross-national situation.

Thus, I produced the six 2D maps by applying SSA (Figure 3).

These SSA maps show that the seven questions regarding political attitudes can be divided into three groups in six countries.

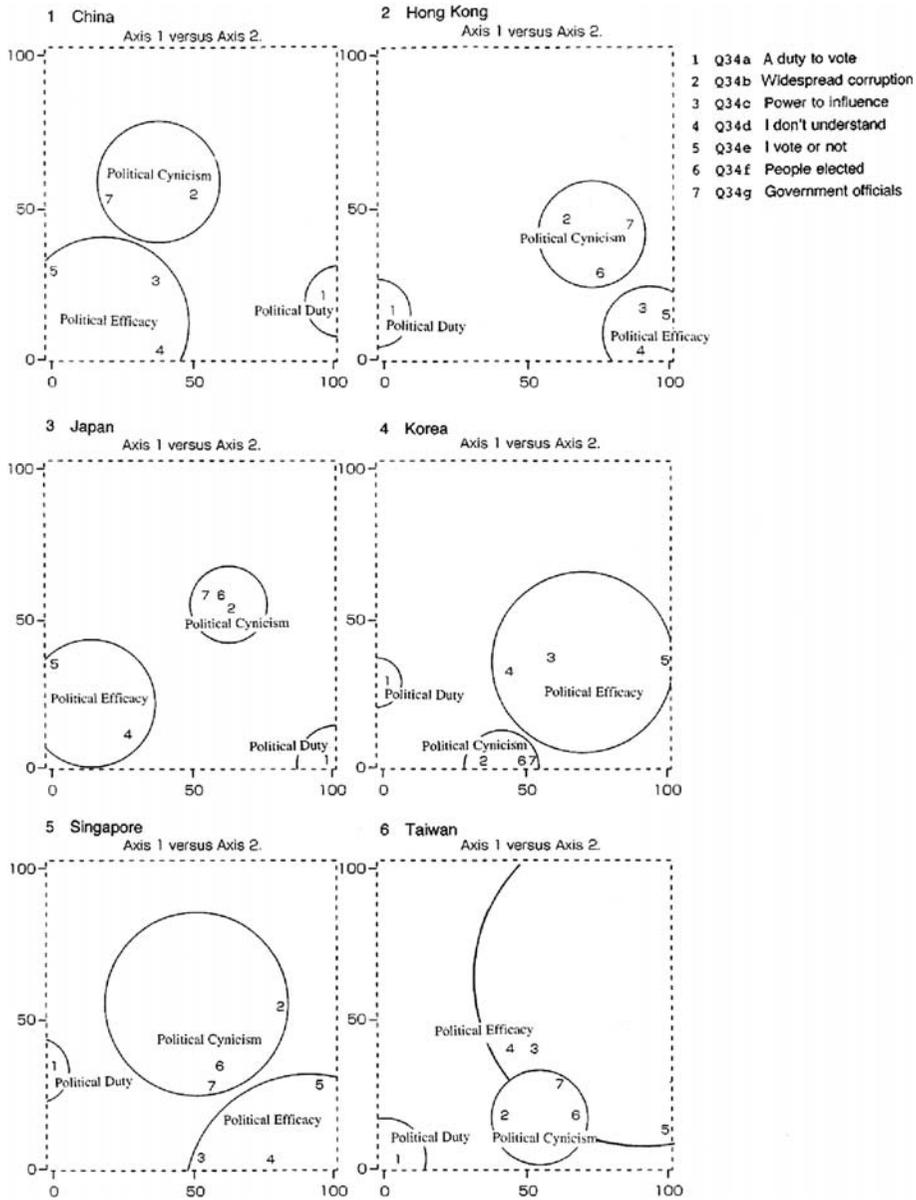


Figure 3 Smallest Space Analysis of the Interrelations among Political Attitudes Items

3 Conclusions

By focusing on the methodological advantages of Smallest Space Analysis, this paper has made several attempts at exploratory data analysis for the purpose of pointing out the significance of the survey, suggesting possible directions for data analysis, and establishing a starting point for future data analysis efforts. It may also be considered an attempt to perform the intellectual ex-

ercise known as “confirmation of dimension” as a first step in empirical research on social phenomena. This kind of intellectual exercise will make it possible to proceed with an analysis of relationships between multiple dimensions confirmed. These kinds of data analysis procedures constitute an approach based on what is called “data science.”

Appendix I: Guttman’s Weak Monotonicity Coefficient

Given N pairs of observations $\{(x_i, y_i); i = 1, 2, \dots, N\}$ on two numerical (ordinal or interval) variables x and y , the weak monotonicity coefficient μ_2 between x and y is defined as follows:

$$\mu_2 = \frac{\sum_{i=1}^N \sum_{j=1}^N (x_i - x_j)(y_i - y_j)}{N \sum_{i=1}^N \sum_{j=1}^N |x_i - x_j| |y_i - y_j|}$$

The coefficient between two variables x and y is in some sense a correlation coefficient between these variables. It tells us how much two variables vary in the same sense. In other words, when x increases does y increase or not.

(Amar and Toledano, 2001. P.119, 219)

Appendix II: Algorithm and Software

Given a symmetric matrix of dissimilarity coefficients $\{D_{ij}\}$, D_{ij} being the coefficient between elements V_i and V_j , we want to represent the elements ($V_k; k = 1, \dots, n$) as points in an m -dimensional Euclidean space such that the following monotonicity condition is fulfilled “as well as possible”:

$$D_{ij} < D_{kl} \Leftrightarrow d_{ij} < d_{kl} \tag{1}$$

for each quadruplet (i, j, k, l) , d_{ij} being the computed Euclidean distance between points representing V_i and V_j , in the m -dimensional space:

$$d_{ij} = \sqrt{\sum_{a=1}^m (x_{ia} - x_{ja})^2} \tag{2}$$

The monotonicity condition is fulfilled as well as possible for dimensionality m thought to be the smallest.

The solution is noted:

$$x = \{x_{ia}\}_{i=1, 2, \dots, n; a=1, 2, \dots, m}$$

(Amar and Toledano, 2001. p.223.)

The software use in this study is called “HUDAP”, and the spatial partitioning lines are also drawn using the software.

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References

- ALMOMD, G. A. and VERBA, S. (1963): *The Civic Culture: Political Attitudes and Democracy in Five Nations*, Princeton University Press, Princeton, New Jersey.
- AMAR, R. and TOLEDANO, S. (2001): *Hudap Manual with Mathematics and Windows Interface*, Second Edition, The Hebrew University of Jerusalem.
- BORG, I. and SHYE, S. (Eds.) (1995): *Facet Theory: Form and Content*, SAGE Publications, Thousand Oaks, London, New Delhi.
- BORG, I. (1998): A Facet-Theoretical Approach to Item Equivalency, *NACHRICHTEN SPEZIAL, ZUMA*, No.3, Mannheim, Germany.
- CANTER, D. (Ed.) (1985): *Facet Theory: Approaches to Social Research*, Springer-Verlag, New York, Berlin, Heidelberg, Tokyo.
- FUKUYAMA, F. (1995): Trust, Free Press, New York.
- LEVY, S. (Ed.) (1994): *Louis Guttman on Theory and Methodology: Selected Writings*, Dartmouth, Aldershot.
- MANABE, K (2001): *Facet Theory and Studies of Japanese Society*, Bier'sche Verlanganstalt, Bonn.
- ROBINSON, J. P., SHAVER, P. R. and WRIGHTSMAN, L. S. (Eds.) (1991): *Measures of Personality and Social Psychological Attitudes*, Academic Press, San Diego, New York, Boston et al.
- SHYE, S. (Ed.) (1978): *Theory Construction and Data Analysis in the Behavioral Sciences*, Jossey-Bass Publishers, San Francisco, Washington, London.

Remark

This paper is based on the author's presentation which was made at the Specialized Session of the Joint Conference of Italian and Japanese Classification Societies “Analysis and Modeling of Complex Data in Behavioral and Social Sciences” held at Anacapri, Italy, 3–4 September, 2012.

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Abstract

The purpose of this paper is to illustrate the utility of Smallest Space Analysis (SSA) developed by Louis Guttman for the data analysis of cross-national survey using the example of the AsiaBarometer survey. The AsiaBarometer is a large scale multi-national questionnaire survey conducted at regular intervals (every year from 2003) within the Asia region. This paper analyzes the data from the 4th AsiaBarometer survey which was conducted from June to August 2006 in seven countries: China, Hong Kong, Japan, South Korea, Singapore, Taiwan, and Vietnam.

The AsiaBarometer survey contains question items that measure the respondents' beliefs, attitudes and behaviors in various aspects of everyday life, as well as items intended to measure their values related to freedom, human rights, and democracy, and their political behaviors. In this data analysis, I deal with the following three groups of question items: (1) question items on "well-being," (2) question items on "social trust," and (3) question items on "political attitudes."

Key words: cross-national comparison, equivalence of measurement, exploratory data analysis, weak monotonicity coefficient, smallest space analysis