Data Analysis of the AsiaBarometer Survey:
Methodological Discussions and Exploratory Data Analysis*

Kazufumi MANABE**

I. Introduction

The issues addressed in this paper are methodological in nature, dealing with the AsiaBarometer, a cross-national survey. There have been numerous discussions of the problems of cross-national surveys and even more broadly scoped cross-cultural surveys. I have conducted reviews of the literature in this field and examined the various methodological problems with cross-national/cultural surveys, focusing especially on "survey equivalence." Thus I have already developed a list of the methodological problems involved in conducting such surveys. Using this as a kind of check list can facilitate an investigation of the methodological problems associated with the AsiaBarometer Survey, which alone should be highly useful. This time, however, I will use this check list only in the following two ways:

(1) I will not investigate all of the methodological problems associated with the current AsiaBarometer Survey, but will only address those points that are conducive to the development of positive hypotheses regarding the significance of the survey and its utility value.

(2) Methodological problems have been discussed and defined using various standards and

---

* Key words: public utility, well-being, trust, political attitude, POSA, SSA, Median Regression Analysis
** Professor, School of Sociology and Social Work, Kwansei Gakuin University, Japan

1) Professor Takashi Inoguchi, initiator of this survey, says the following about the AsiaBarometer: The AsiaBarometer is a public opinion survey conducted at regular intervals that covers the entire Asian region. First conducted in 2003, it is to be implemented for 10 years. Public opinion surveys focus on the everyday lives of ordinary people. How do ordinary people live out their everyday lives? How do they feel about various aspects about their lives? What kinds of hopes do they have about various aspects of their everyday lives? It has the fundamental characteristics of what is referred to as a "general social survey." But it doesn’t stop there. It goes on to ask groups of questions on such topics as the nature of the relationship people have with their larger society (for example, their family, neighborhood, workplace, government, company, police, and military), how they evaluate their relationship to society, and what kinds of hopes they have for their relationship with society. It also asks questions about values and norms that are less relevant to ordinary people, regarding such topics as freedom, human rights, competition, regulations, individualism, and democracy and related political attitudes. (Todai International Symposium AsiaBarometer, May 6, 2003, University of Tokyo, p. 3)

2) The results of my past literature reviews are presented in the following articles:


"Kokusai hikaku chousa ni okeru resuponsu-suке-ru no toukasei ni kansuru kenkyuu (2)," School of Sociology Journal, No. 89, Kwansei Gakuin University Graduate School of Sociology and Social Work, March 2001, pp. 107–121.


"Tsuu bunka hikaku chousa oyobi kokusai hikaku chousa no houhouronteki kadai: Toukasei kakuritsu no tame no houhou no kaihatsu," School of Sociology Journal, No. 96, Kwansei Gakuin University Graduate School of Sociology and Social Work, March 2004, pp. 95–110.
frameworks. For example, Alwin, Braun, Harkness, and Scott (1994) divide them into problems concerning measurement approaches ("questions regarding the personal attributes and social environment of the respondents" and "questions regarding the respondents' opinions, attitudes, and behaviors"), the impact of social change on replication issues, the translation of survey questions, and data analysis. Johnson (1998) divides the questionnaire planning and implementation processes into four phases: question development, questionnaire pretesting, data collection, and data analysis. In this paper, after describing the types of problems that have arisen in conducting the AsiaBarometer, I will examine them by focusing on the “data analysis” phase. Still, rather than conducting an exhaustive examination of the methodological problems of cross-national/cultural surveys by focusing on the “data analysis” phase, I am going to use this check list to conduct an exploratory data analysis of the AsiaBarometer Survey that can lead to positive hypotheses about the significance of the survey and its utility value, as described in item (1) above.

In the next section, I discuss the methodological problems with the AsiaBarometer Survey, and in the following section I discuss several attempts at conducting exploratory data analysis. This kind of methodological analysis will reconfirm the significance of the AsiaBarometer Survey and the utility value of its data.

II. Examination of the Methodological Problems with the AsiaBarometer Survey

(1) Methodological Advantages of Cross-National/Cultural Surveys

Cross-national/cultural surveys have several methodological advantages. Here I would like to address only the following two points regarding the advantages and significance of the AsiaBarometer Survey.

Although sociology aims to formulate general propositions about human behavior, the bulk of our principles, propositions, and laws in sociology are generalizations based upon observations and measurements made in Western, urban, industrial societies.

Therefore comparative research in countries outside of Western Europe is extremely important. Research projects that have gained global attention in fields that use questionnaire surveys to try to objectively measure people’s attitudes, opinions, and behaviors, as well as the values underlying them, include the (1) Eurobarometer, (2) International Social Survey Programme (ISSP), and (3) European and World Values Survey (WVS). However, these surveys mainly focus on the countries of North America and Europe. This makes the AsiaBarometer Survey, which focuses on international comparisons between the countries of Asia, all the more important. Takashi Inoguchi, initiator of this survey, points out two of its advantages:

First, it makes Asian social phenomena the subject of numerous academic research projects all over the world. …Second, strengthening academic research based on a shared awareness of problems (here, a common questionnaire) increases scientific knowledge… Hypotheses derived from Asian social phenomena may produce world-leading scientific knowledge.

The AsiaBarometer Survey also has the advantage of being able to be linked to the family of “political culture” research. People’s attitudes, opinions, and behaviors toward politics, as well as the values underlying them, are conceptualized as “political culture.” In this sense, the areas targeted by this research

---


are positioned as sub-areas. I divide the family of research on political culture into four stages:\(^5\): (1) prehistory (1930s–40s), (2) prosperity (1950s–60s), (3) criticism (1970s), and (4) revival (1980s onward). One of the features of the fourth stage is an emphasis on the diversity of political cultures, as suggested by Daniel J. Elazar in *The American Mosaic* (Westview Press, 1994) and Michael Thompson, Richard Ellis, and Aaron Wildavsky, in *Cultural Theory* (Westview Press, 1990). This has opened up ways of analyzing the diversity of values known as “Asian values” based on empirical survey data. Thus, one of the advantages of the AsiaBarometer Survey is that it allows us to identify and understand the diversity in subjective orientations among the peoples of Asia.

Although both of the advantages mentioned above have a role in the development of empirical propositions, the former is comprehensive and general while the latter is more limited and specific. Thus, the latter is more conducive to the attempts at “exploratory data analysis” addressed in the next section.

Another advantage of the AsiaBarometer Survey is as follows:

One possible methodological advantage of the cross-national survey is that many of the problems that can be ignored when one is dealing with a single nation must now be faced explicitly. Cross-national research encourages the reinvestigation and clarification of concepts (variables) and ensures that equivalence problems are carefully examined\(^6\).

I have always emphasized that social science research is advanced through conceptualization and operationalization, the former which relies in large part on the researcher’s insight and imagination, and the latter which relies on their methodology and techniques. To facilitate the latter, I have advocated a policy of “methodological pluralism” and have made proposals aimed at the “development of new methods.” In reality, however, the key to social science research lies in the former, that is, the ability to develop rich and varied ideas that have not been addressed by existing concepts. Cross-national surveys offer opportunities to reexamine existing concepts and chip away at their apparent self-evidence. This is one of the most important methodological advantages of cross-national surveys.

Consider, for example, the data analysis I conducted on a joint research project with Professor Ronald Inglehart, initiator of the World Values Survey. In this study, we extracted 19 questions from the WVS that we believed comprised the concept of well-being. We then used factor analysis to investigate whether common factors could be identified for these various questions in each country, and whether, if the wordings were changed, the concept of well-being could be captured by these 19 questions in different countries. The results showed that the common factors in each country were quite different. These results told us that our concept of well-being needed to be reexamined\(^7\).

Our examination of those questions enabled us to reexamine important social science concepts such as “well-being,” “trust,” and “political attitude,” in the AsiaBarometer Survey as well. This will be dealt with in greater detail in the next section.

(2) Methodological Problems with Cross-National/Cultural Surveys

As already mentioned, cross-national/cultural surveys pose a variety of methodological problems. This section will not provide exhaustive coverage of all of these problems, but will touch on the methodological problems that are believed to influence the identification of new directions for theorization in this research field.

---


In cross-national/cultural surveys, there is little intentionality aimed at formulating laws of human behavior. Survey knowledge is not being accumulated in such a way as to facilitate the establishment of scientific laws in this field through the construction of theoretical frameworks for surveys, questionnaire design, and appropriate data analysis.

The problem is that the more attention that is placed on the nation- or culture-specific aspects of this kind of survey research, the less likely it is that the results will be able do anything more than describe individual phenomena. This does not lead to the development of cumulative knowledge. The same problem was identified by AsiaBarometer initiator Inoguchi:

If a study is limited to Japan, too much attention is focused on the complexity or uniqueness of Japanese social structures. As a result, the potential for developing more generalizable propositions may be lost. If, by contrast, a study looks not only at Japan, but also at South Korea, Singapore, the Philippines, China, and Thailand, generalizable hypotheses can be derived from it.

However, simply pointing this out leaves us with what R.K. Merton calls a “general orientation.” To overcome this, we need to determine what kind of general propositions, laws, or theory-oriented analytical devices need to be developed.

This can go in one of two directions, the development of substantive propositions, laws, and theories or the development of formal propositions, laws, and theories. The former will be discussed later. With regard to the latter, I will only state my view that L. Guttman’s Facet Theory is an effective methodological strategy for developing formal propositions, laws, and theories.

(3) Types of Cross-National/Cultural Surveys

There are two types of cross-national/cultural surveys.

1. Theoretical hypothesis investigative (THI) model: The emphasis of the survey is on investigating a general theory or a specific hypothesis deductively derived therefrom. For example, one may be interested in determining if relationships observed between several variables in one country also exist in other countries. If they do, the proposition regarding the relationships between those variables is corroborated. In this type of survey, the researcher is not interested in a particular country. Thus, from the perspective of establishing a theory or law, each of the countries in which the survey is conducted comprises a context, or unit (Kohn, 1989).

2. Social reality descriptive (SRD) model: Describing differences between countries comes from an interest in the countries being studied. In this case, each country is positioned as an “object of analysis” (Kohn, 1989).

Of course, a cross-national survey refers to a survey that is conducted in several different countries, and thus involves the “repetition” or “replication” of the survey. There are two types of replication used in cross-national surveys:

---

9) Takashi Inoguchi, p. 154.
Literal replication: When the exact same type of sampling method, survey implementation method, question wording, etc. is used in all surveys.

Conceptually equivalent replication (conceptual replication): When the procedures and measures of the survey, that is, the survey questions, are not exactly the same, but are developed in such a way as to make them more equivalent in the context of international comparison, with due consideration as to how well they fit within the context of each country.

These two types can be viewed as Weber’s “ideal types,” but they are often mixed in real life; there is no “pure type” of either one. However, identifying the main characteristics of the two types is useful in examining the two models of cross-national surveys mentioned above, the THI and SRD models. THI surveys tend to be interested in “conceptual replication” while SRD surveys tend to place greater emphasis on “literal replication” (Lykken, 1968).

The ISSP emphasizes literal replication, but this does not necessarily make the ISSP an SRD cross-national survey. In fact, its attempts to verify various theoretical hypotheses through a secondary analysis of the data suggest that it cannot be categorized as an SRD model with any certainty.

By contrast, Inglehart’s WVS was originally categorized as a THI survey that attempts to verify a hypothesis derived from an independent argument regarding the phases of basic social changes. The theory it was supposed to address was “a unique combination of three theories: the hierarchy of needs theory, the political generation theory, and the theory of postindustrial society.” Maslow created a hierarchy of human needs comprised of, from lower to higher, physiological needs, safety needs, love needs, esteem needs, and self-actualization needs (Maslow, 1943, 1970). While the generations that experienced preindustrialization deficiency and war tend to place priority on “materials and safety,” generations raised in a postindustrialized world of prosperity and peace tend to prioritize “love, esteem, and self-actualization.” Inglehart has developed a hypothesis in which he refers to the former as “materialistic values” and the latter as “post-materialistic values,” and argues that as societies reach the stage of postindustrialization (Bell, 1975), their central values tend to be post-materialistic (Inglehart, 1997).

A secondary analysis of the WVS data makes it possible to describe the unique characteristics of each country by focusing on the collective distribution patterns of attitudes, opinions, and behaviors of the people of that country.

The arguments above also apply to the AsiaBarometer Survey. That is, while the AsiaBarometer Survey is a THI survey, it also has some of the characteristics of an SRD survey. This is simply because, as seen in the debate over “literary independence,” it is possible for data users to go beyond the intent of the survey initiators—we have already seen that the intent of the AsiaBarometer Survey initiator was not at all single-faceted—and conduct data analysis from their own perspectives.

III. Data Analysis of the AsiaBarometer Survey: Attempts at Exploratory Data Analysis

The 3rd AsiaBarometer Survey was conducted in the following 14 countries in south and central Asia in 2005: Afghanistan, Bangladesh, Bhutan, India, Kazakhstan, Kyrgyzstan, Maldives, Mongolia, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan. This article examines the data from three countries in each of the two regions surveyed: India, Pakistan, Sri Lanka, Kazakhstan, Mongolia, and Uzbekistan.

The following must be noted regarding the type of data analysis that will be conducted using the data from these six countries. This article uses three techniques of Facet Analysis developed by L. Guttman, that is, Partial Order Scalogram Analysis (POSA) and Smallest Space Analysis (SSA). I have characterized the current effort as an “exploratory data analysis,” and have selected these methods because they are particularly effective for such an effort.

1. POSA: Analysis of Public Utilities (Electricity, Water and Gas)

While striving to ascertain the level of access to public utilities in each country, this analysis also aims to construct a theory of public utility development based on that information. The former goal reflects an interest in the "nation specific aspects" of the country, while the latter reflects an interest in "generalization, laws, and theory." I have previously discussed the two aspects of the AsiaBarometer Survey, as a social reality descriptive model (SRD) survey and a theoretical hypothesis investigative (THI) model survey, and the topics covered in this article are extremely relevant to the development of that discussion. I do not know whether what we might call a general theory of public utility development exists. However, it is important to examine whether that development is one-dimensional or multidimensional in Asia.

What kinds of methods of data analysis can be used for conducting such an examination? Here I will use one of the techniques of Facet Analysis developed by L. Guttman, Partial Order Scalogram Analysis (POSA). POSA is a data analysis technique categorized as a multidimensional scaling method, but it makes it possible to do more than simply determine whether the responses to questions comprise a partial scale. It also makes it possible to classify each of the households in each Asian country surveyed within a theoretical response pattern.

The survey question regarding public utilities asks "Can your household use the following public utilities?", and the public utilities selected are "1. The public water supply, 2. Electricity, 3. Liquefied petroleum gas (LPG)."

The specific procedures for conducting a POSA analysis are as follows:

1. First, for each of the response categories (1. Water, 2. Electricity, and 3. LPG), assign responses marked with a $\bullet$ a value of 1, and responses not so marked a value of 0.

2. Assign "Do use" responses for each of the three public utilities by household with a value of 1, and "Do not use" responses a value of 0 to yield a response pattern that can be displayed as a number of three figures in the binary system of notation.

3. Draw a theoretical grid pattern, beginning with the households that indicated that they do not use any of the three public utilities, followed by households that use one of the utilities, households that use two of the utilities, and finally households that use all of the utilities.

4. Calculate the frequency of appearance (a real number) of each response pattern in this theoretical grid pattern.

Following these procedures, the response patterns for the three utilities and their frequency can be diagramed, as shown in Figure 1. For example, in the case of India, the survey was conducted among 1,238 households. Since the theoretical grid only contains 1,216 households (22 cases yielded a 101 pattern, which falls outside of the theoretical grid), however, the ratio (reproducibility) is 1,216 divided by 1,238, or 98.2%. An examination of Figure 1 shows that most households in Uzbekistan are connected to electricity, water, and natural gas utilities, and an atypical pattern was found in Kazakhstan, where households that were connected to electricity and gas outnumbered those connected to electricity and water, but the most typical overall pattern (in terms of frequency of appearance) that could be theoretically conceived revealed expanding connectivity to electricity, water, and then gas, and this was far more prevalent than the other possible patterns. This suggests that these items comprise a "one-dimensional scale" across countries. Thus, the data depict the conditions of each country with regard to public utility connectivity in clear relief, as in the case of Uzbekistan and Kazakhstan, while also suggesting generalizable propositions that go beyond the specific circumstances of each country—that utility connectivity occurs in a particular order, from electricity, to water, and then gas. To reiterate, these two aspects are extremely important in the analysis of data from cross-national/cross-cultural surveys. That is, careful attention must be paid to the unique circumstances of each country/culture as well as to the generalizable propositions that can be derived from studying each country/culture.
Figure 1: POSA of Public Utility Connectivity

India

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(95)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1108)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 1216</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 1216/1238 = 98.2%
Another pattern: 101(22)

Kazakhstan

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(48)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(143)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(435)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 626</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 626/800 = 78.3%
Another pattern: 101(174)

Mongolia

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(21)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(78)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(655)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(36)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 777</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 777/800 = 97.1%
Another pattern: 101(3)

Pakistan

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(18)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(78)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(68)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(490)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(416)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 1072</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 1072/1085 = 98.8%
Another pattern: 101(13)

Sri Lanka

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(69)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(180)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(488)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 746</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 746/813 = 91.8%
Another pattern: 101(67)

Uzbekistan

<table>
<thead>
<tr>
<th>Gas</th>
<th>Water</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0)</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(791)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 795</td>
</tr>
</tbody>
</table>

( ): Frequencies
Reproducibility = 795/800 = 99.4%
Another pattern: 101(5)
2. Smallest Space Analysis: Analyses of Well-Being, Trust and Political Attitudes

The standard practice in the data analysis of cross-national/cross-cultural surveys is to start with comparisons of the “simple tabulations of each variable (question item)” and then to move on to comparisons of the “relationship patterns between variables (question items).” This process is conducive to the application of advanced methods of multivariate analysis. However, this also requires preparatory work. In one sense, the preparatory work of seeking out the direction of the data analysis might be considered a form of “exploratory data analysis.” In questionnaire survey data analysis, researchers first look at the overall structure and relationships between the data, and then focus on a particular aspect of the data to try to conduct a deeper level of analysis. This process is derived from a belief in the importance of “boiling down the data.” In this study, we will begin with a Smallest Space Analysis (SSA) based on a “correlation matrix,” a matrix which shows the structure of the relationships between variables (question items). This analytical method has been selected because I believe it to be the best suited to depicting the overall structures and relationships of the data.

SSA is a type of multidimensional scaling method, and expresses the relationship between n items shown in a correlation matrix by the size of the distance between n points in an m-dimensional (m < n) space. The higher the correlation between two variables, the smaller the distance between them on the map, and the lower the correlation, the larger the distance. Usually a two-dimensional (plane) or three dimensional (cube) space is used to visually depict the relationship between items.

(1) Well-Being

The group of question items classified under the heading of “well-being” contains 18 question items: Q5 (a question item on the feeling of happiness), Q6a-p (16 question items on life satisfaction), and Q7 (a question item on the objective standard of living).

Here I created a correlation matrix showing the relationships between question items on well-being in the six countries of India, Kazakhstan, Mongolia, Pakistan, Sri Lanka, and Uzbekistan, and obtained the following six two dimensional maps using SSA. The circles shown in these maps reflect an effort to apply meaning to (interpret) the spatial distribution of the question items based on the empirical law of L. Guttman’s Facet Theory. To make those interpretations easier to decipher, the number of each question item is enclosed in either a ○ (circle) or △ (triangle). A circle indicates that the correlation coefficient with the “feeling of happiness” (Q5) is 0.3 or higher, while a triangle indicates that it is 0.2 or higher. The SSA map shows that the structure of well-being is depicted by a series of concentric circles with Q5, the feeling of happiness, at the center. All the questions are then distributed throughout these circles, at various levels in accordance with their content relevance with Q5. The numbers of the question items closest to the “feeling of happiness” are enclosed in a circle, while the next-closest are enclosed in a triangle. The numbers of question items located outside the space are not enclosed in either a circle or triangle. This kind of analysis makes it possible to visually discern how close a relationship there is in each country between the people’s “feeling of happiness” and their “life satisfaction”—in other words, the aspects of the relationship between the “feeling of happiness” and “life satisfaction.”

I would now like to describe the unique aspects of the SSA maps for each of the six countries examined. First, however, it may prove useful to identify a commonality among all of the countries, that is, the position of the four question items regarding public safety, the environment, social welfare, and the democratic system. Among the question items asked regarding life satisfaction, these four were slightly different in terms of their content than the others. While the other question items tended to address the “personal sphere,” these four tended more to address the “institutional sphere.” In a sense, the difference between these may correspond to the conceptual distinction between “small happiness” and “great happiness” proposed by Tamotsu Aoki. Turning our attention back to the SSA maps for these questions

---

Figure 2  Smallest Space Analysis of the Interrelations among Well-being Items
items, we find, based on an investigation of these meanings, that these four items comprise a single independent space in all of the countries. This can therefore be identified as a common facet seen in every country.

In some cases, the space composed of these four question items is located far away from the space comprised of the other question items, while in others it overlaps with part or all of the space comprised of the other question items. Examples of the former are India and Mongolia, while examples of the latter are Kazakhstan (fully overlapping), Sri Lanka (three question items overlapping), Pakistan (two question items overlapping) and Uzbekistan (one question item overlapping). Even in those cases exhibiting the most overlap, the numbers of the overlapping question items—except in the question item on the environment in Kazakhstan—were at most only enclosed in a triangle, indicating that even the degree of overlap was not all that large. While on the one hand this clarifies the differences between countries, on the other, it also allows generalizable propositions that go beyond nation specific differences—such as the cross-cultural conceptualization of “small happiness” and “great happiness”—to be established. To determine where these nation specific differences come from would require an investigation of the various economic, political, social, and cultural conditions in each country.

Next, there are two types of question items that have been characterized as belonging to the “personal sphere”: instrumental question items, on such topics as housing, income, standard of living, job, health, and education, and consummatory question items, on such topics as marriage, family life, friends, neighbors, and leisure. Based on this distinction, the SSA maps in each country show that there are countries in which people’s “feeling of happiness” is close to the instrumental question items (such as India and Sri Lanka) and countries in which it is close to both the instrumental and the consummatory question items (such as Uzbekistan and Mongolia). Explaining this distinction will require individual intensive analyses of the relationships between the social and cultural factors in each country.

2) Trust

The battery of 22 question items addressed in this analysis are divided into three question items on “interpersonal trust” (Q11, Q10, and Q12) and 19 question items on “institutional trust” (Q27a-s). The former three question items are as follows: “Generally, do you think people can be trusted or do you think that you can’t be too careful in dealing with people?” (Q10), “Do you think that people generally try to be helpful or do you think that they mostly look out for themselves?” (Q11), and “If you saw somebody on the street looking lost, would you stop to help?” (Q12). The latter 19 question items ask if the respondent trusts institutions, organizations and systems, such as “the central government,” “your local government,” “the army,” “the legal system,” “the police,” and “parliament.”

Here again, I have created a correlation matrix showing the relationships between these question items for the six countries being examined, and have obtained the following six two-dimensional maps using SSA.

In this case, the similarities shared by the countries are even more remarkable than the differences between them. The question items related to people’s social trust are shown in concentric circles in all of the countries, but question items 1, 2, and 3 on interpersonal trust are located in the inner concentric circle, while question items 4–22 on institutional trust are positioned in the outer concentric circle. In other words, there tends to be a disjuncture between interpersonal trust and institutional trust. Specifically, the tendency to say “I trust people,” but “I don’t trust institutions” appears to be consistent across all of the countries. Even the question items labeled as “institutional trust” question items can be divided into two groups: the group from the central government to the political party, and the group from the public education system to the International Monetary Fund. The former are institutions in the “political sphere”, while the latter are part of the “economic, social, and cultural sphere.”

This is not to say that there are no cross-national differences. While the disjuncture between the two types of trust is common across all countries, the size of that disjuncture varies. A closer inspection of the SSA maps of each of the countries shows that the positions of each of the question items are slightly
Figure 3  Smallest Space Analysis of the Interrelations among Trust Items
Figure 4 Smallest Space Analysis of the Interrelations among Political Attitudes Items
different. Here, again, the maps serve two purposes. On the one hand, they facilitate the establishment of
generalizable propositions—the disjuncture between interpersonal trust and institutional trust—, while on
the other they serve to elucidate the specific characteristics of each of the countries.

Active debates around the theme of “trust” addressed in this section have been developed over the
past decade. F. Fukuyama, one of the instigators of those debates, makes an analytical argument in his
book *Trust* (NY: Free Press, 1995) regarding the relationship between the social structure and the people’s
sense of trust in various countries. The generalizable proposition suggested above is viewed as contributing
to the development of Fukuyama’s argument.

(3) Political Attitudes

The AsiaBarometer survey contains several question items intended to ascertain people’s political
attitudes. For the purpose of this data analysis, I will examine a battery of seven question items, Q31a-g.
These question items have been used in various political attitude surveys conducted since G. A. Almond
University Press, 1963). Once again, I will begin by examining the content of these question items. A
careful examination reveals that these seven question items can be divided into three groups: (1) a
question item regarding political duty (ᶃ), (2) question items regarding political cynicism (ᶄᶈᶉ), and
(3) question items regarding political efficacy (ᶘ münchen). The purpose of this data analysis is to verify
whether this conceptualization is applicable across cultures.

Thus, I created a correlation matrix showing the correlations between these seven questions, and obtained
the following six maps using SSA.

These SSA maps show that the seven question items regarding political attitudes can be divided into
three groups in virtually every country. In Pakistan, however, ᶀ Q31g (“Government officials pay little
attention to what citizens like me think”) belongs both in the sphere of “political cynicism” and “political
efficacy.” The analysis above suggests that the three-pronged conceptualization of political attitudes as
political duty, political cynicism, or political efficacy is applicable across countries. In this case, too,
however, further investigation of the specific conditions in Pakistan must be conducted to determine why
ᶀ Q31g has characteristics of both “political cynicism” and “political efficacy.”

3. Median Regression Analysis: An Analysis of the Relationship between Political Attitudes and
Political Behaviors, and Objective and Subjective Indicators

The previous section reported the results of the SSA based on correlation matrices showing the
relationships between question items, and suggested some directions for future analysis based on those
findings. I have attempted to use SSA as a first step in the exploratory data analysis of the AsiaBarometer
Survey because I wanted to broadly discuss the overall structure and relationship of the data before
proceeding to a more in-depth analysis that focused on the particular aspects of that data, and because I
believe that SSA is a particularly effective tool for that purpose. However, as with any method of data
analysis, SSA is not perfect. Because it is fundamentally based on correlation coefficients, it allows the user
to discern larger trends in the relationships between question items (variables), but is incapable of showing
certain aspects of the data. These aspects can be ascertained through the use of Median Regression
Analysis.

This analytical method was developed by L. Guttman to easily ascertain whether a relationship
between two variables is monotonistic or polytonistic. However, Guttman did not explain this method
anywhere. I learned this method directly from Guttman at the Israel Institute for Applied Social Research in
1976. Later, I named it “median regression analysis” and asked experts to create a computer program to
perform the calculations involved. This method finds the position of the center value (median: the 50%
position) for each column in a cross-table that shows the relationship between two variables, and then
draws a regression line by connecting the center points in order from the left column to the right column.
(1) Analysis of political attitudes and political behaviors

This analysis examines two survey question items. The former regarding political attitudes (Q31e) asks the respondent’s level of agreement with the statement “Since so many people vote in elections, it really doesn’t matter whether I vote or not.” The response categories are: 1. Strongly agree, 2. Agree, 3. Neither agree nor disagree, 4. Disagree, 5. Strongly disagree. The latter regarding political behavior (Q30a) asks “How often do you generally vote in national elections?” The response categories for voting frequency are: 1. Every time, 2. Most of the time, 3. Sometimes, 4. Rarely, 5. Never voted.

The results of the analysis are shown in the figures below. In these figures, the horizontal axis indicates voting attitudes (cynicism to activism), while the vertical axis indicates voting frequency (“Never voted” to “Every time”). Thus, a line rising upward to the right in a figure indicates a positive correlation between the two variables. The shapes of the regression lines fall into three patterns: (1) a deep V-shaped pattern rising upward to the right (Kazakhstan, Sri Lanka), (2) a shallow U-shaped pattern where the heights of both the left and right lines are about even (India, Mongolia, Uzbekistan), and (3) a shallow bell-shaped pattern in which the apex occurs toward the right end of the curve (Pakistan).

Further explanation of these three patterns may be useful here. Pattern (1) occurs when the respondents who disagree with the statement about political cynicism indicate a high frequency of voting in national elections. This would be considered a reasonable response pattern. Pattern (2) occurs when those who disagree as well those who agree with the statement report the same level of voting frequency. In this case, a high voting frequency by those who deny political cynicism makes reasonable sense, but the same voting frequency by those who agree with the statement raises questions as to why. A further examination of the discrepancy between this attitude (cynicism) and behavior (voting) would be extremely interesting in and of itself, but the discrepancy itself undeniably constitutes a problematic situation. Pattern (3) occurs when those who deny cynicism indicate a low level of voting frequency, a discrepancy that constitutes another problematic situation.

(2) Analysis of the Relationship between the Objective and Subjective Indicators of Well-Being

This analysis will use “last year’s pre-tax household income” (F8) as an objective indicator of well-being and “satisfaction with household income” (Q6e) as a subjective indicator of the same. The results are shown in the figures below.

![Figure 5: Voting Behavior (Frequency) and Voting Attitude (Cynicism)](attachment:image.png)
In these figures, the horizontal axis represents the objective indicator (low to high), while the vertical axis represents the subjective indicator (low to high). The figures generally exhibit patterns that rise upward to the right, but upon closer examination, two patterns emerge: (1) countries in which a monotonistic relationship exists between the two variables (India, Mongolia, Pakistan, Sri Lanka), and (2) countries in which a polytonistic relationship exists between the two variables (Kazakhstan, Uzbekistan). In the latter, the regression line showing the relationship between the two variables does not rise upward to the right in a straight line, but shakes like the needle of a seismograph, moving up and down among those with higher annual household incomes.

The second pattern shows that people with higher household incomes are not necessarily satisfied with those incomes. This is attributed to the idea that people with high household incomes expect to make higher incomes, and thus are not satisfied with what they have because of their expectations. The discrepancy between the objective and subjective indicators may be an indicator for predicting social change. As McDowell and Newell point out, the results in each country suggest that "this theme leads to the fascinating political issue of whether to plan social programs on the basis of factual indicators, or on the basis of people’s subjective responses."

**IV. Conclusion**

By focusing on the methodological advantages and disadvantages of the AsiaBarometer Survey based on its characteristics as a cross-national/cross-cultural survey, 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 exercise known as “dimensional confirmation” 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.”

However, this paper also makes a suggestion about data analysis attempts from other perspectives, that

---

is, that the AsiaBarometer Survey be used to examine hypotheses that have been deductively derived from theories developed in different disciplines, such as political science, sociology, and psychology. The AsiaBarometer Survey has a great deal of latent potential in this regard. Making the data available to the public is likely to encourage researchers in a wide variety of fields to use that data in examining their various theoretical hypotheses.
Data Analysis of the AsiaBarometer Survey: 
Methodological Discussions and Exploratory Data Analysis

ABSTRACT

The third wave of the AsiaBarometer Survey was conducted in the following 14 countries in south and central Asia in 2005: Afghanistan, Bangladesh, Bhutan, India, Kazakhstan, Kyrgyzstan, Maldives, Mongolia, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan. This article examines the data from three countries in each of the two regions surveyed: India, Pakistan, Sri Lanka, Kazakhstan, Mongolia, and Uzbekistan.

This article also uses three techniques of Facet Analysis developed by L. Guttman, that is, Partial Order Scalogram Analysis (POSA), Smallest Space Analysis (SSA) and Median Regression Analysis. I have characterized the current effort as an “exploratory data analysis,” and have selected these methods because they are particularly effective for such an effort.

The first section of this paper deals with the methodological advantages and problems of the AsiaBarometer Survey as a large scale multi-national comparative survey.

The second section presents exploratory data analyses using Facet Analysis as follows:
1. POSA: Analysis of Public Utilities (Electricity, Water and Gas)
2. Smallest Space Analysis: Analysis of Well-Being, Trust and Political Attitudes
3. Median Regression Analysis: An Analysis of the Relationship between Political Attitudes and Political Behaviors, and Objective and Subjective Indicators of well-being

By focusing on the methodological advantages and disadvantages of the AsiaBarometer Survey based on its characteristics as a cross-national/cross-cultural survey, 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.

This paper also makes a suggestion about data analysis attempts from other perspectives, that is, that the AsiaBarometer Survey be used to examine hypotheses that have been deductively derived from theories developed in different disciplines, such as political science, sociology, and psychology. The AsiaBarometer Survey has a great deal of latent potential in this regard. Making the data available to the public is likely to encourage researchers in a wide variety of fields to use that data in examining their various theoretical hypotheses.

Key Words: public utility, well-being, trust, political attitude, POSA, SSA, Median Regression Analysis