Discussion Paper No.362

# Does the man away from home need feel no shame? An Analysis of the heterogeneity of consumers' eco-friendly behavior

Misuzu TAKAO
Chuo University
Faculty of Economics

December 2021


INSTITUTE OF ECONOMIC RESEARCH
Chuo University
Tokyo, Japan

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# An Analysis of the heterogeneity of consumers' eco-friendly behaviour

**Misuzu TAKAO**
**Assistant Professor, Faculty of Economics, Chuo University**
**E-mail: mtakao441@g.chuo-u.ac.jp**

**ABSTRACT**

In this research, we focus on the eco-friendly behavior of tourism consumers. It has been posited that the eco-friendly behavior of people during ordinary consumption is not the same when they are tourists. In Japan, there is a proverb: "Any man away from home need feel no shame." This means that people tend not to behave in an eco-friendly manner when they are visitors (for example, littering with a cigarette or drawing graffiti on buildings, and monuments). In this paper, consistency of eco-friendly consumer behavior means that the consumer, anytime and anywhere, always chooses eco-friendly products and services. Focusing on variation in consumer behavior between ordinary and tourist consumption, this paper analyzes the consistency of consumers' eco-friendly behavior. The Japanese proverb about the tourist implies such an inconsistency in behavior. However, this does not mean that an eco-friendly tourism consumer is not an eco-friendly consumer in general.

Table.1 Four consumer types

| | | Consumption in tourism | |
|---|---|---|---|
| | | Eco-friendly | Not eco-friendly |
| consumption in usual | Eco-friendly | 194 | 259 |
| | Not eco-friendly | 62 | 488 |

We classify consumer behavior from the viewpoint of content and manner (Table 1). From the consistency perspective, we examine whether or not (1) consumers who always behave in an eco-friendly manner generally will behave in the same manner as tourists, and (2) consumers who always behave in an eco-friendly manner as tourists also do so during usual consumption. To clarify the factors that give rise to heterogeneity among consumers' eco-friendly behavior, we conducted a web-based questionnaire survey in Japan during August 2017. The survey explored:

- eco-friendly behavior in usual consumption (seven items);
- eco-friendly behavior in tourism consumption (seven items) including items considered in Dunlap et al. (2000) and Hirose (1994);
- the NEP scale (15 items); and
- the two-step behavior decision-making model (six items).

Responses for all items were collected using a 5-point Likert scale. On applying a covariance structure analysis to these results, we were able to (1) examine what factors result in heterogeneity among consumers and (2) show the logical outcomes by the path diagrams. Moreover, we consider whether consumers' utility can be interpreted with a prospect-type utility function as advocated by Kahneman and Tversky (1979). As a result of the analysis, we found that consumers who behave in an eco-friendly manner in both the usual and tourism contexts have a significant factor intention on environmental risk cognition.

The results yield the following implications:

(1) The finding that consumers who behave in an eco-friendly manner in tourism tend to do so in general implies that to make a consumer behave in an eco-friendly manner in tourism is necessary for the consumer to behave likewise in their usual consumption.

(2) The finding that consumers who behave in an eco-friendly manner consistently, anytime and everywhere, have significantly higher environmental risk cognition than those who do not. This result implies that to make a consumer behave in an eco-friendly manner, we need consumers to identify the environmental risks.

**Key words:** consumers' eco-friendly behavior, eco-tourists, consistency,

**JEL Classification:** D12, Q58, Z38

## 1. Introduction

In modern societies, companies who supply goods and services and consumers who demand them are usually opposing forces in the market. Companies maximize profits, whereas consumers maximize individual utility. Through these behaviors, optimal behavior of each subject is assumed. In this study, we examine heterogeneity in consumer's selection behavior, especially among consumers' criteria of utility maximization when choosing goods and services. We focus on differences in consumer purchasing behavior, such as whether an individual selects environmentally friendly goods, whereas another does not. Considering the heterogeneity of consumers, we clarify differences in choice behaviors among consumers, focusing on eco-friendly comportment among tourists. Some have posited that eco-friendly behavior of people during regular consumption is not the same as when they are tourists.

In this study, we focus on a consumer's environmentally conscious behavior in tourism and think about solving environmental problems from there. In Japan, the "Visit Japan Campaign" has been conducted since 2003, and ever since the "Basic Law on the Promotion of Tourism" went into effect in 2007, the market for tourism has been expanding. Consumer's purchasing behavior has a significant influence on the environment presently, within a markedly mass-production and mass-consumption society. Some analysis of environmentally conscious behaviors in tourism under such social conditions is warranted, since that behavior is thought to play an essential role in fomenting environmental problems. The underlying purpose of this thesis is, therefore, to clarify what factors are different between individuals who carry out environmentally conscious actions in tourism and those who do not, and, as a result, we suggest adoption of tourist policies necessary to promote environmentally conscious behavior.

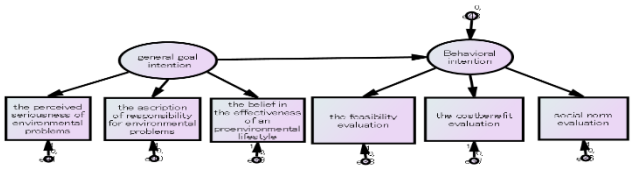
## 2. Previous research

There are various studies pertaining to the consumer's environmental conscious behavior. This analysis' position and characteristics are as follows.

Hirose (1994) is typical of the consumer's purchasing decision model. He proposed a two-step purchasing decision model (Figure 1) noting that the intended target influenced one's behavioral intentions. In this model, the formation of the intended target is influenced by the recognition of environmental risks, recognition of responsibility attribution, effective coping cognition, and formulation of intended action that includes feasibility evaluation, cost–benefit analysis, social norms evaluation, all of which are thought to have an impact. Other researchers who use this model include Ohtomo et al. (2004) and Kurishima (2012).

In this study, using the aforementioned model and a questionnaire survey, the intended target and intended action with respect to environmental problem countermeasures (e.g., global warming) are determined. Then, using the results, the kinds of factors caused by environmentally conscious consumer actions are clarified.

**Figure.1 Determinants of environment-conscious behavior (adapted from Hirose(1994))**



The new ecological paradigm (NEP) scale is an index of environmental attitudes proposed by Dunlap and Van Liere (1978). Dunlap et al. (2000) later corrected this indicator and measured the environmental attitudes of people by five factors using people's beliefs of environmental importance and human-centrism. In doing so, people are quizzed about their environmental attitudes by questioning each of five measured reality factors: (1) limits to growth, (2) anti-anthropocentrism, (3) fragility of the limits of growth, (4) rejection of exceptionalism, and (5) the possibility of eco-crisis occurring.

In this study, the NEP scale advocated in Dunlap et al. (2000) is used as a survey element. To generate the NEP scale, consumers who take environmentally conscious actions are analyzed according to the question items and causal relationship model between environmentally conscious actions and prescribed factors, from which factors are significantly affected.

In prospecting theory, advocated by Kahneman and Tversky (1979), a prospect-type utility function that extends expected utility theory (considered in microeconomics) is utilized. It transforms the utility function so that it more closely matches real society. This utility function is formulated such that the loss and the gain are not symmetrical, i.e., where losses are estimated to be twice the gains, and it is assumed that people are risk-averse. After introducing prospecting theory, Barberis (2013) reviews it, along with its development and application over a 30 year period.

In this study, prospect-theory's idea of loss is considered twice as prominent than expected gains (i.e., in light of environmental risks, there is a tendency to take risk-averse actions), we hypothesize that consumers take environmentally conscious actions when they examine choices based on the risk perception when forming intended action targets and factors pertaining to "the possibility of an eco-crisis," that loom large on the NEP scale.

## 3. survey method

### 3.1 Items of survey

The research uses a web-based questionnaire survey conducted by Macromill Co., Ltd. The outline of the survey is as follows:

The subjects of the survey were both male and female, from 20 to 69 years old, allocated according to population composition ratios for age, gender, and residential area. Overall, 1,086 (541 males, 545 females) answered and survey, leaving a total of 1,003 effective samples. The survey was conducted from Tuesday, August 8, 2017, through Wednesday, August 9, 2017.

The contents of the questionnaire survey included items (1) to (4) listed below.

For (3), refer to Dunlap et al. (2000), and for (4), we created question items based on Hirose (1994). In all the questions posed, "I agree (5 points)," "I agree somewhat (4 points)," "I cannot say (3 points)," "I mostly disagree (2 points)," and "I do not agree (1 point)" were used. Moreover, answers were sought using based on this five-choice Likert scale.

(1) Environmental consideration in ordinary behavior: 7 items (3 questions on energy, 2 items on attitudes related to agricultural crops, and 2 items on waste handling)

(2) About environmentally conscious behavior as a tourist: 7 items (2 questions on transportation selection, 2 items on a selection of hotel, and 3 items on behavior while at a sightseeing spot)

(3) NEP scale: 15 items (3 items on the reality of limits to growth, 3 items on anti-anthropocentrism, 3 items on fragility of limits of growth, 3 items on the rejection of exceptionalism, 3 items on possibilities, and 3 items on eco-crisis)

(4) Target objectives and intended action for environmental problems countermeasures: 6 items (3 items on intended targets formation and 3 items on intended action formation)

### 3.2 Survey hypothesis

Responses for all items were collected using a 5-point Likert scale. On applying covariance structural analysis to these results, we were able to (1) examine what factors result in heterogeneity among consumers and (2) show logical outcomes by means of path diagrams.

In this study, we make the following hypothesis to clarify factors causing heterogeneity in consumer's environmental conscious behavior in tourism.

(H1) It is not clear that consumers who always behave in an eco-friendly manner generally will behave in the same manner when they are tourists.

(H2) Consumers who always behave in an eco-friendly manner as tourists also do so during their usual consumption.

(H3) Consumers behaving in an environmentally conscious way as tourists have a significant factor load on their risk perception when forming the intended targets and taking into account ecological crises on the NEP scale.

### 3.3 Grouping consumers

To consider the heterogeneity of consumers, they were divided into the four groups listed in Table 1. These cohorts were generated on the basis of environmentally conscious behavior in usual consumption circumstances and the questionnaire regarding environmentally conscious behavior during tourist consumption.

In Table 1, using the questionnaire result, consumers who average 3 or more on the 7 items using environmental considerations in usual consumption behavior, and consumers who average 3 or more on the 7 items using environmental consideration in tourist consumption, were grouped as environmentally conscious individuals.

The groups in Table 1 identify cohorts that are characterized by (1) consumers who are environmentally conscious in their everyday and tourist behavior patterns; (2) consumers who are environmentally conscious except when sightseeing; (3) consumers who do not usually undertake environmental actions and are environmentally conscious in tourism; and (4) consumers who are not environmentally conscious, either in their ordinary or tourist behaviors.

Table.1 Four consumer types

| | | Consumption in tourism | |
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| | | Eco-friendly | Not eco-friendly |
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We analyzed the variance to find differences between the groups, which was significant ($F(3.999) = 427.164$, $p < 0.001$) for the usual environmentally conscious behavior, with environmentally conscious behavior in tourism ($F(3.999) = 286.728$, $p < 0.001$), according to multiple comparisons using group B there was a significant difference between groups (1), (2), (3), and (4).

For each group, the three path diagrams in Figs. 2 to 4 were used to consider differences in factors affecting each consumer's environmentally conscious behavior. These models may be used to do confirmatory factor analysis and are thus placement invariant models.

The model in Fig. 2 shows how much ordinary environmentally conscious actions impacted consumer behavior during environmentally conscious tourism situations. The model in Fig. 3 shows what factors have a major influence when carrying out environmentally conscious action. The model in Figure 4 shows what factors

of the five categories on the NEP scale are significant.

## 4 Results of the empirical research

### 4.1 t-test

In this section, we describe the test results for the three hypotheses listed in Section 2

H1; For 256 consumers whose average of answers to seven questions on environmentally conscious behavior in tourism consumption is greater than 3,

As a result of conducting t-test on environmentally-conscious behaviors in ordinary environment and tourism consumption, we cannot reject the null hypothesis that there is no difference in average (Table 2).

Therefore, it can be said that

(H1) It is not clear that consumers who always behave in an eco-friendly manner generally will behave in the same manner when they are tourists.

Table.2 t- statistics (1)

| | mean | stdev |
|---|---|---|
| in usual | 3.518 | 0.592 |
| in tourism | 3.482 | 0.354 |

| | |
|---|---|
| correlation coefficient | 0.510 (p<0.01) |

| | mean | stdev | t value | degree of freedom | p value |
|---|---|---|---|---|---|
| t-test | 0.357 | 0.512 | 1.116 | 255 | 0.265 |

H2; As a result of conducting a t-test on environmentally-conscious actions in ordinary environmentally conscious actions and tourism consumption for 453 consumers whose average of seven items is larger than three points on environment-conscious behavior in usual consumption behavior,(P <0.01) (Table 3).

Therefore, it can be said that

(H2) Consumers who always behave in an eco-friendly manner as tourists also do so during their usual consumption.

Table 3 t-statistics (2)

| | mean | stdev |
|---|---|---|
| in usual | 3.59 | 0.419 |
| in tourism | 2.962 | 0.649 |

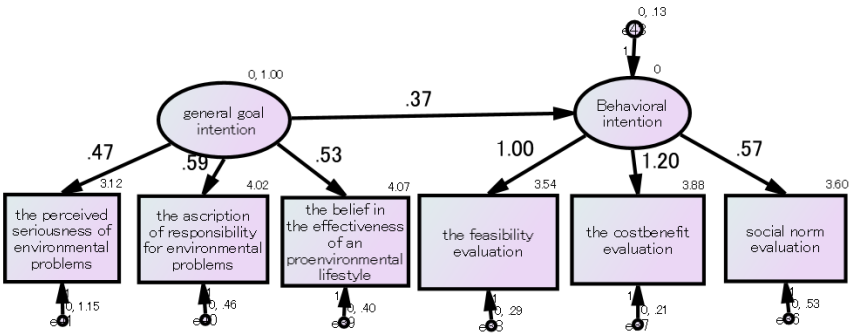
| | |
|---|---|
| correlation coefficient | 0.375 (p<0.01) |

| | mean | stdev | t value | degree of freedom | p value |
|---|---|---|---|---|---|
| t-test | 0.628 | 0.627 | 21.312 | 452 | 0.001 |

**4.2 Factor linkage between environmentally conscious actions and prescribed factors**

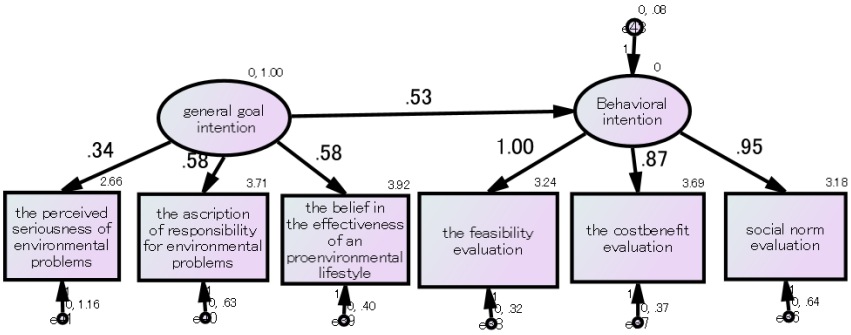
The results obtained are given in Fig. 2 through Fig. 5.

Figure2. Consumers who are environmentally conscious in their everyday and tourist behavior patterns




RMSEA=.063 CFI=.910

Figure3. Consumers who are environmentally conscious except when sightseeing




RMSEA=.063 CFI=.910

Figure.4 Consumers who do not usually undertake environmental actions and are environmentally

conscious in tourism

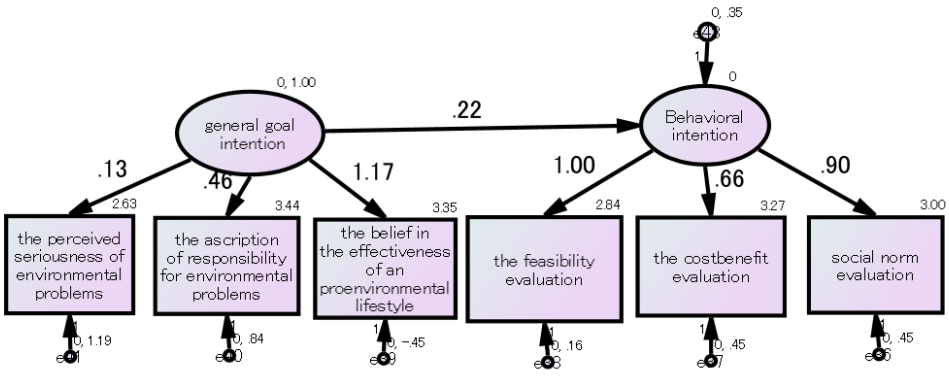
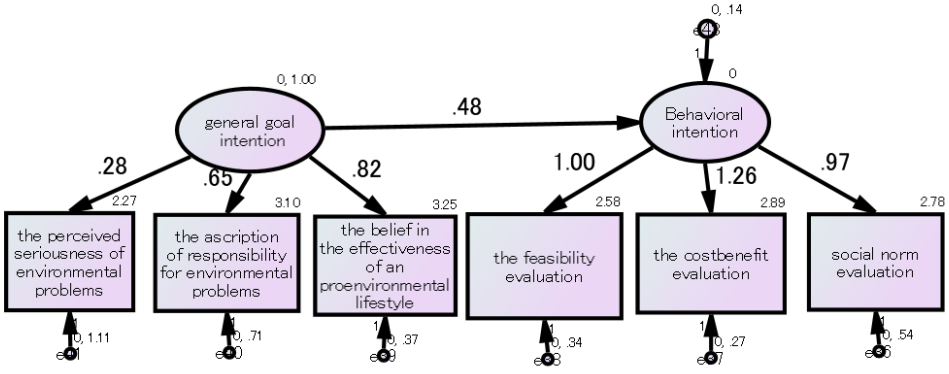



Figure.5 Consumers who are not environmentally conscious, either in their ordinary or tourist behaviors.



(H1), the path coefficients from the latent variables of the intended targets pertaining to environmental risk recognition were ① 0.475, ② 0.342, ③ 0.125, and ④ 0.275, respectively. ① gives the group of consumers who take action, having a higher passive coefficient than the group that does not. It shows that risk perception has a big influence on environmentally conscious behavior.

### 4.3 NEP scale

Figures 6–9 is a path diagram related to the NEP scale.

Figure6. Consumers who are environmentally conscious in their everyday and tourist behavior patterns

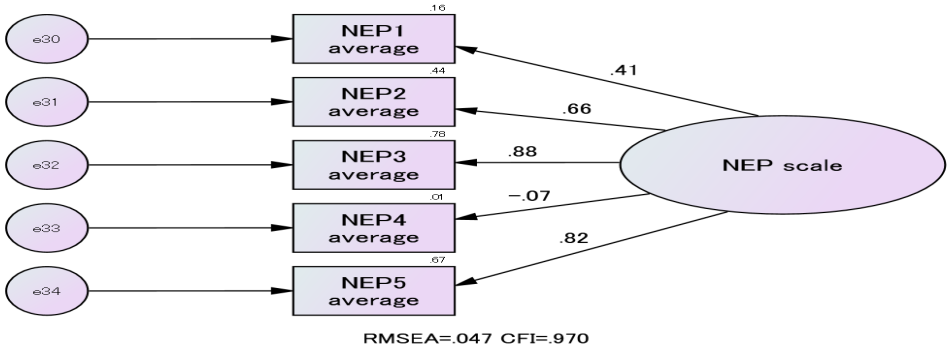



Figure7. Consumers who are environmentally conscious except when sightseeing

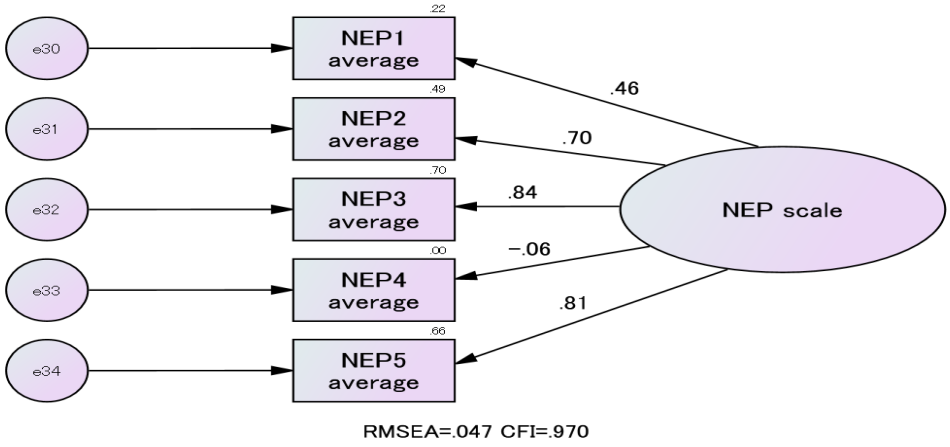



Figure8.Consumers who do not usually undertake environmental actions and are environmentally conscious in tourism

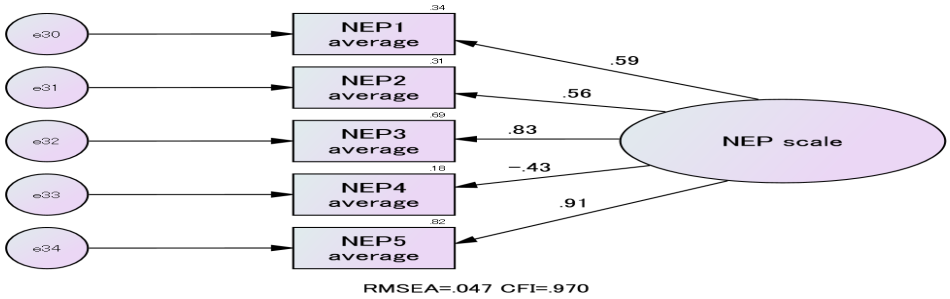
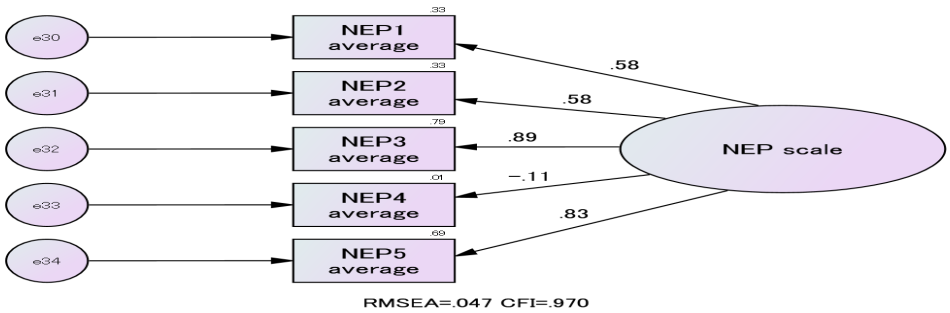



Figure9. Consumers who are not environmentally conscious, either in their ordinary or tourist behaviors.




For (H1), the path coefficients from the NEP scale's latent variables related to potential ecological crises (NEP5) are ① 0.819, ② 0.811, ③ 0.906, and ④ 0.828, respectively. Group ① which is environmentally considerate, shows consumption behavior in tourist spots and their ordinary behavior was found to have a significant influence on the possibility of an ecological crisis in the formation of their intended action.

## 5 Consideration and Further Remarks

Individuals that perform tasks with environmental consideration when consuming tourist activities and their usual consumption were considered upon applying factor analysis. Then, hypotheses (H1) to (H3) cited in 3.3.1 were examined.

Responses for all items were collected using a 5-point Likert scale. On applying a covariance structure analysis to these results, we were able to (1) examine what factors result in heterogeneity among consumers and (2) show the logical outcomes by the path diagrams. Moreover, we consider whether consumers' utility can be interpreted with a prospect-type utility function as advocated by Kahneman and Tversky (1979). As a result of the analysis, we found that consumers who behave in an eco-friendly manner in both the usual and tourism contexts have a significant factor intention on environmental risk cognition.

The results yield the following implications:

(1) The finding that consumers who behave in an eco-friendly manner in tourism tend to do so in general implies that to make a consumer behave in an eco-friendly manner in tourism is necessary for the consumer to behave likewise in their usual consumption.

(2) The finding that consumers who behave in an eco-friendly manner consistently, anytime and

everywhere, have significantly higher environmental risk cognition than those who do not. This result implies that to make a consumer behave in an eco-friendly manner, we need consumers to identify the environmental risks.

For future studies, consider that this study divided consumers into four groups and analyzed each of the factors related to environmentally conscious behavior, along with the factors associated with the determinants and the influence of the NEP scale. The average values of answers pertaining to actions involving environmental considerations and usual consumption in each group, as well as the environmental considerations during sightseeing consumption differed significantly, thus making it necessary to think about them. In addition, the relationship between factors related to environmental action and determinants and the NEP scale were limited, even though forming a structural analysis of these effects on daily consumption and tourism consumption were sought, and the results faced problems of model adaptation. In this regard, the model must continually be improved. The points will have to be raised again in future analyses.

Regarding causality, the quantitative analysis conducted in this study does not mention causality reasoning
By t-test, firstly, "Consumers who are environmentally conscious in ordinary consumption behavior are environmentally conscious concerning tourism consumption?", moreover, secondly "Environmentally conscious consumers in tourism consumption do take actions that are environmentally conscious?" are examined.

In this analysis, although the correlation can be described, causality is not analyzed. Therefore, we cannot determine the direction of causality.

Generally, in structural equation modeling, the following three methods are used to determine the direction of causality.

As a first step, we estimate the causal relationship based on the fitness of the model. If the created model is a high fitness model, a model is created in which the direction of the model and the causal direction are reversed. Under the assumption of the opposite causal relationship, it is a method of confirming that the model is incompatible. However, if the fitness is the same in both model analyzes, it is called an equivalence model, and it is not possible to distinguish between models.

In that case, as a second stage, analysis using operation variables is performed. The method of estimating the causal relationship by the manipulated variable method uses an operation variable that affects only one of the two variables in the relationship between the explanatory variable and the explanatory variable. Like the idea in the first stage, we create two conflicting models and estimate the causal relationship by the fitness of the model.

In order to deal with such a problem, here we estimate the causal relationship of the quantitative analysis carried out in this research following the procedure described above.

First, estimate the causal relationship of the whole sample. We measure factor scores of observation variables consisting of question items such as "energy reduction behavior," "attitude toward agricultural crops," and "action to reduce waste" as usual environmental conscious actions. Next, we measure the factor scores of observation variables composed of question items such as "choice of transportation," "selection of hotels" and "actions at tourist spots" as environmentally conscious behaviors in tourism consumption. The correlation coefficient between them was 0.591.

Therefore, it was shown that there is a certain degree of correlation between usual environmentally conscious actions and environmentally conscious behaviors in tourism.

Let us view the causal relationship of latent variables from the viewpoint of the goodness of fit. When RMSEA is used as an indicator of the fitness of the model, we found that a model that subtracts the path from "ordinary environmentally conscious behavior" to "environmentally conscious behavior in tourism", and a model that subtracts the path from "environment-conscious behavior in tourism" to "ordinary environmentally conscious behavior" are maybe an equivalent model because the fitness degree of both models were 0.088.

Next, we consider a model using latent variables. The variables that can be used as operational variables, which do not correlate with "eco-friendly behavior in tourism" and which may affect "eco-friendly behavior in usual," are not prepared in this questionnaire survey.

Finally, the analysis was performed assuming a bidirectional causal model, but this was impossible to apply appropriate constraint conditions.

I would like to improve the model as a future subject for these points.

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