Relationships between Perceptions and Lifecycle Environmental Burdens of Waste Prevention Behaviors

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Introduction

Although fostering Waste Prevention Behaviors (WPB) has been considered to be important, one question comes up: "Does each WPB really contribute to reduction of all environmental burdens?" Reduction of wastes derived by WPB is visible and easily understandable for people, while change of other environmental burdens like greenhouse gases (GHGs) emission cannot be easily recognized by people. Therefore, the gaps between people's perceptions on the behavior and some actual environmental burdens derived from the behavior may exist. To investigate those gaps and differences of people's perceptions based on their characteristics, we compared people's perceptions on environmental burdens among alternative choices and with the real environmental burdens estimated based on the Life Cycle Assessment (LCA).

Scenario Settings

We selected five cases in daily life when people's choice from multiple options is required. The cases are selection of (a) shopping bags, (b) cups at a café, (c) refillable products, (d) disposable dishes, and (e) storage ways for cooked rice. Multiple alternative options were considered for each case.

LCA Estimation

The functional unit was set for each option and LCA was conducted. All processes, such as material extraction, transportation, production, usage, washing, and disposal processes, were included in the estimation. The estimated environmental burdens were GHGs emission, acidification gases emission, fossil resource consumption, final waste disposal as well as household waste generation.

Questionnaire Design

To compare with LCA results, people's perceptions on the selected WPBs were investigated through an online-questionnaire. The questionnaire consisted of six parts: 1) pair-wise evaluation between the options in the same scene, 2) pair-wise evaluation between the different scenes, 3) questions for daily behaviors, 4) questions for collective guilty and anxiety, 5) questions based on Cultural Theory, 6) demographics, and 7) open question. Based on the Cultural Theory, people can be categorized into 4 groups: "Hierarchist", "Individualist", "Egalitarian", and "Fatalist". This theory is also adapted to Eco-indicator 99, where the standard method of Lifecycle Impact Assessment is shown. The questionnaire was answered by men and women aged 20 to 69 years in Japan. The age and sex distributions were adjusted to coincide with the parent population. We got 6,205 valid answers.

Results and Discussions

The answers for the pair-wise questions were analyzed in the Analytic Hierarchy Process manner. The weight how much the respondent thinks the option worse for the environment was calculated as allocation of 1.0 in total. Good concordance between the people's perceptions and garbage generations was observed. On the other hands, the big gaps were observed between the people's perceptions and GHGs emissions. Some options people think better for the environment than the others were quite worse options from the viewpoint of GHGs emission.

It was also revealed that the people who have more "Fatalism" characteristics have less concern about the WPBs. We cannot identify the chicken or the egg, however, the

people who conducted WPBs routinely had more concern about WPBs.