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Advancing Sustainable Consumption in Korea and Japan—From Re-Orientation of Consumer Behavior to Civic Actions

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Abstract: With sustainability being one of the most common issues facing consumers and society today, this paper explores the status of sustainable consumption in Korea and Japan—societies expected to drive the changes pertaining to sustainable consumption in Asia. Although Korea and Japan have been implementing sustainability-related policies, there is still room for development of sustainability in terms of consumers' participation. As sustainable consumption is defined as consumers' environmental decision-making process, which requires cognitive efforts, it is necessary to understand individual's sustainable consumption based on the conceptual model of behavior, in order to encourage the adoption of more sustainable consumer practices. Being grounded in the revised Theory of Reasoned Action, which adds consumers' awareness, pro-environmental self-identity, and descriptive norm, this study contributes to a better empirical understanding of the factors that underlie sustainable consumption behaviors with respect to social-cognitive viewpoint. By involving a survey of Korean and Japanese respondents' awareness, descriptive norm, practical behavior to 47 specific activities, as well as attitude and pro-environmental self-identity, the study works on two levels: on one level, it is a study of sustainability-related consumer activities and behaviors in Korea and Japan; on another level, it identifies key variables to explain sustainable consumption behavior through hierarchical regression analysis. The results show that among the numerous sectors requiring prioritized expansion of sustainable consumption, the area of consumer citizenship has received relatively little publicity. Another important finding is that the failure to practically engage in sustainability-related activities by consumers cannot simply be attributed to knowledge deficit, as consumers in both countries appropriately recognize sustainable consumption. Our results clearly illustrate that consumers perform sustainable consumption behavior based mostly on socially shared connotations—the descriptive norm—while the other key variables affecting sustainable consumption are awareness, and pro-environmental self-identity. However, we also observed that there is no significant effect on attitude, indicating that even a favorable attitude toward performing sustainability-related activities does not directly translate into actual behavior. This paper shows how consumer perceptions of the normality of environmentally friendly behaviors can be used for the design of strategies to promote sustainable consumption in Korean and Japanese societies. In addition, we provide practical guidelines for the expansion of sustainable consumption tailored for the characteristics of each society.

Keywords: sustainable consumption; descriptive norm; environmental awareness; pro-environmental self-identity; sustainability in Korea and Japan

1. Introduction

The term “sustainable consumption” was formally introduced by the Oslo Symposium in 1994, and since then interest in it has grown among researchers, practitioners, and policy-makers world-wide—including in both Korea and Japan. More recently, sustainable consumption has been defined as a holistic approach aimed at minimizing the environmental impacts of social consumption and production systems, involving individuals deliberately seeking to minimize the adverse effects of the consumption of consumer and investment goods and services through rationalization and utilization of production factors, and the reduction of generated post-production and post-consumption waste [1]. While other definitions of the term have also been proposed by different researchers, Kiełczewski (2011) [2] simply described it as a structure where the shape of individual systems and relationships between them enable the achievement of sustainable development objectives.

Since the 1990's, the topic of sustainable consumption—and related problems such as changing the view of consumption, and creating new consumption patterns—has been a common concern amongst researchers, and its importance has had a great impact on modern societies. Consequently, the question of how sustainable consumption behavior can be promoted features prominently on the agenda of policy-makers and researchers alike [3]. In particular, sustainable consumption envisages that consumer behavior will play a major role in climate change and other sustainability-related issues [4,5]. While individual consumption behavior is expected to result in a slight reduction of negative environmental effects, individual consumption habits in developed countries appear to have more significant impacts on the environment. As higher income countries tend to pollute more owing to the concentration of economic activities [6], rapid industrialization in developed countries, and the consequent increase in pollution levels have raised concerns about the unsustainability of current consumption. At the same time, it is also clear that the tendency of unsustainability in those countries decreases due to environmental regulations and development of technology, after reaching a certain point of economic development [6].

Korea and Japan—heavily industrialized countries with the highest GDP per capita in North-East Asia, and regarded as front runners in environmental innovation in the subregion—are expected to drive the changes pertaining to sustainable development and consumption in the Asia-pacific area [7]. While the shift to sustainable society is an urgent agenda in the Asia-pacific region with resource-intensive economic growth, there has been no fundamental trend in reversing environmental and resource losses in the subregion, particularly considering that emerging markets such as China drive the expansion of consumption [8]. Not only do the regional cooperation platforms dedicated to sustainable consumption play an instrumental role in the development of regional strategies for sustainable society, but developed countries are expected to play key roles in the expansion of sustainability in subregions; naturally, Korea and Japan play a central role in the value chains with the resource-efficient production practices. However, there is still room for further development of sustainability in both Korea and Japan, as the improvement of efficiency at each point will not be enough to achieve sustainable consumption in terms of individual consumers' participation in everyday life. That is, it is required that individual consumers consider the impacts from all life-cycle stages of the consumption process, as well as voluntarily perform various sustainability-related activities with critical deliberation [7,9]. Given that sustainable consumption is defined as consumers' environmental decision-making process which requires cognitive efforts, the elaborated behavioral model can provide understanding as well as prediction of individual's sustainable consumption. With Korea and Japan introducing policies to take the initiative to accelerate the transition to sustainable consumption, the empirical study of consumers' practical behavior helps not only individual consumers adopt more sustainable consumer activities in both Korea and Japan, but also developing countries in the subregion follow in the footsteps toward sustainability. However, only a few studies in literature have theoretically or empirically analyzed the wide range of sustainable consumption from re-orientation of consumer behaviors—considering all the process of consumption—to consumers' civic actions between the two countries.

This study develops an approach to sustainable consumption that influences behavior by consumers' conceptions of what is normal as well as their awareness, attitude and self-concept. In particular, we identify specific sustainable consumption behaviors, which show room for further development and require prioritized encouragement, in terms of consumers' practice in each country. In addition, we present quantitative research which explored consumers' understandings of sustainable consumption behaviors in terms of their awareness, attitude, self-identity, as well as perception of descriptive norm. We develop elaborative behavioral models of sustainable consumption based on a revised Theory of Reasoned Action (TRA), which serves consumers' contextual thinking and decision-making with respect to social-cognitive process, since consumers' voluntary eco-friendly behavior requires cognitive efforts with critical deliberation. Our results indicate that there was general consensus among consumers about which activities were sustainable and favorable, while the perceptions about their normality and self-concept were different. This demonstrates the potential for segmentation and targeting for promoting sustainable consumption, on the basis of consumers' conceptions of normality and self-identity. Our study can contribute to expansion of sustainable consumption in both Korea and Japan by nurturing bottom-up initiatives, since we identify the areas specific to the two societies for improvement, demonstrating the importance of developing strategies on the basis of key variables which effectively trigger changes in consumer behaviors. Furthermore, given that Korea and Japan share not only homogeneous cultures [10] but also face the common challenge of combating environmental problems at domestic, regional, and global levels, our study can also provide guidelines for the successful expansion of sustainable consumption in China—having the greatest potential to expand the ranks of consumers—as well as the whole Asian region, by offering approaches to promote sustainable consumption.

The rest of this paper is structured as follows. The next section reviews relevant studies of sustainable consumption. This is followed by a discussion of the theoretical foundations, a description of the research methodology, and the research results. The last section includes conclusions, as well as research discussion and limitations.

2. Sustainable Consumption

A widely used definition of “sustainable consumption” was formally introduced by the Oslo Symposium in 1994, first posed as “the use of services and related products which respond to basic needs and bring a better quality of life, while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations.” This definition is broad, having multiple meanings. First, this implies that sustainable consumption should be performed by each participant of the market, production units, and individual consumers, implying the responsible use of available goods and resources at the level of individual, business, governments and international structures. Second, this relates to both environmental protection and utilization, equally. Third, this pursues the balanced well-being between current consumer generations and future generations [11]. As sustainable consumption has been considered a major theme of sustainable development since being introduced in the 1990's, both developing and developed countries try to accelerate the shift towards sustainable consumption and promote it [12].

The reason sustainable consumption has received so much attention is that there is no doubt that consumers' behaviors have had unprecedented impact on the natural environment. Since all of the environmental problems facing the world today are connected with consumption patterns, the new UN Guidelines for Consumer Protection in 2016 listed the “promotion of sustainable consumption” as one of the major goals of global consumer policy [13]. Considering that consumer goods affect the environment throughout their life-cycle—from production to disposal—it is obvious that environmental problems are connected with all the process of individual's consumption. In order to respond to environmental and social problems and to expand the sustainable consumption, it is necessary not only to symptomatically treat the symptoms of individual issues, but also to transform

human activities fundamentally and change the consumer values and lifestyles [14]. Transition to sustainable society and consumption is possible by identifying and nurturing bottom-up initiatives [15], therefore, it is expected that today's consumers play a core role in the achievement of sustainable consumption through responsibilities, along with other market participants. This has resulted in sustainable consumption being defined as a set of consumers' environmental values and attitudes that lead to social awareness and an environmental decision-making process [16].

Research suggests that the majority of consumers have a favorable attitude toward sustainable consumption. Many studies have reported consumers' demand for sustainable options, and according to Nielson in 2015, almost 66% of consumers worldwide report being willing to pay extra for sustainable offerings. Nielson (2017) also revealed that 81% of global consumers agreed that corporations should help improve the environment, 73% of respondents also answered they would change their consumption habits to reduce the impact on the environment and half of them would willing to pay for environmentally friendly products. While consumer's environmental consciousness seems to be increasing, sustainable consumption has been known to be promoted by government regulations and policies [17]. This belief led to the development of the so-called "10-Year Framework of Programmes on Sustainable Consumption and Production" (10YFP), a global commitment to accelerate the shift towards sustainable consumption and production in both developed and developing countries. Participating countries—which includes Korea and Japan—have already taken action in the implementation of this initiative: Korea operates a volume-based waste fee system linked to purchasing waste bags and accompanied by recycling, which has resulted in a 14% reduction in municipal waste and a 50% increase in recycling in the last ten years; similarly, Japan associates consumer education with sustainability, aiming to promote sustainable packaging and recycling through the 3R—reduce, reuse and recycle—campaign [18].

Although sustainable consumption has been the main focus, problems have also been identified relating to sustainable consumer behavior in academic and practical fields. First, consumers often do not subsequently display sustainable actions in spite of their favorable attitudes toward environmental impact [19]. This discrepancy between what consumers say (intention) and do (practical behavior) is arguably the biggest challenge for public policy makers and companies to promote environmentally friendly consumption [20]. Second, weak level of sustainable consumption is dominantly viewed as mainstream. Weak sustainable consumption involves a re-orientation of consumption towards its rationality and efficiency with a general increase in consumption, depending on improved energy efficiency of equipment and other technological solutions. In contrast, strong sustainable consumption, which is rarely highlighted, is related to the change and reduction of consumption in general, requiring consumers to give up to consumption at current level [21,22]. Third, most of the focus has primarily been on the limited role of consumers as a purchase decision-maker. With perspectives on certain consumption behavior as intent-based approaches, newer approaches which highlight the role of consumer as citizens and their expression in civic action should be considered [23,24]. As the consumer-citizen is known to be a core element in efforts to bridge the gap between sustainable attitudes and unsustainable behavior, spillover between pro-environmental behaviors in the private and public domains is potentially important for the mobilization of consumer-citizens for a sustainable society [24].

3. Theoretical Foundations

The Theory of Reasoned Behavior (TRA) [25–27] is one of the most influential and well-supported theories for understanding and predicting individual consumer's behavior. TRA model explains behavior in terms of complex relationships between attitudes, perceptions of norms, intention, and behavior [26]. According to the model, attitude refers to the degree to which a person has a favorable evaluation of the behavior in question, which is formulated by beliefs on the outcomes for performing any behavior, and the perceived importance of that outcome for the actors. This model assumes that a consumers' decision to engage in a particular behavior is based on the outcomes which

they expect will come as a result of performing the behavior, so that it provides the understanding of individual's voluntary behavior which requires cognitive efforts [28]. In this respect, TRA model is widely used and popular conceptual frameworks for consumer's action, particularly in the domain of ethical or environmental consumption behavior with respect to social-cognitive viewpoint [29]. This model serves to analyze for the contextual thinking decision, for environmental behavior which requires critical deliberation based on cognitive process [30].

However, while compelling in some ways, this approach is belied by the identification of "attitude-behavior" and "intention-behavior" gaps [29,31,32]. Moreover, the link between attitude and behavior is known to be rather weak, especially for sustainable behavior [33]. Since the translation from attitude and intention to actual buying behavior remains poorly understood, researchers such as Carrington et al. (2010) [34], Gimmer and Miles (2016) [35] have revised the original model to provide the theoretical framework which can be applied and modified to understand the purchase decision-making process of the ethically minded consumers, while attitude and perceived norms have been reported to have a direct effect on actual behavior [36]. Moreover, it is also known that individual's practical behavior can be prompted in the absence of intention in the relational culture, such as collectivism which both Korea and Japan have [10], due to the contextual influences that may intervene between intention and behavior [37].

In this respect, Rettie et al. (2012) [5] emphasized the norm and social system based on the social ecological perspective, so that they studied green consumption behavior based on individuals' perceived norm, within the sociological context of social normalization. As consumer behavior can be understood in relation to social systems, the descriptive norm—which describes what is typical or normal, and motivate action by providing evidence as to what type of behavior is likely to be effective, adaptive, and appropriate [38]—has been taken into account in a number of sustainable consumption behavioral domains. That is, as observing other's behavior is one major method of obtaining information about the normal way to behave, perceptions of others' behavior contributes to the prediction of pro-environmental behavior. Cialdini et al. (1990) [39], Allcott and Mullainathan (2010) [40], Van Herpen et al. (2012) [41], Kormos et al. (2015) [42], Demarque et al. (2015) [43] showed the significant effect of descriptive norm on individual's sustainable consumption, such as behaviors of littering, energy saving, purchasing organic and fair trade products. In addition, since it has been also reported that the descriptive norm qualifies as an additional predictor of behavioral domains, even more than other variables of TRA such as attitude [22,44,45] suggested a framework for the human social behavior which highlights the perceived social pressure, following the TRA.

Within the context of this paper, the significance of meaning in descriptive norm is particularly strong. Descriptive norm has been reported to have relations with not only attitude but pro-environmental self-identity, increasing the predictability of individual's sustainable consumption [38,46]. In addition, while there is also an evidence for the importance of self-identity in the ethical context of individual's attitude, pro-environmental self-identity—which refers to individuals possessing a sense of self that embraces pro-environmental actions [47–49]—constitutes an important additional predictor in the TRA model as a key motivator in consumer's adoption of sustainability-related activities [50–54]. That is, as pro-environmental self-identity is a strong cross-situational motivation for environmentally-significant behavior, which directly explains sustainable consumption behavior [55,56], the variable of pro-environmental self-identity is included in the revised form of TRA.

Lastly, we also address consumers' awareness of sustainable consumption. It is known that increased environmental awareness does not necessarily lead to pro-environmental behavior [57,58], because individual's behavioral process often goes on outside of conscious awareness. However, at the same time, consumers' awareness can lead certain behaviors to being concerned with sustainability, and encourage personal behavior to become more environmentally friendly to some extent [59], since individuals tend to act on the basis of their perceptions rather than on the basis of scientific definitions of sustainable consumption [60]. As awareness has both a cognitive, knowledge-based component and

an affective, perception-based component, there is a linear progression of environmental knowledge leading to awareness, which in turn leads to pro-environmental behavior [61,62].

4. Methodology

The survey was administered by a professional market and consumer research agency, Macromill Embrain. The study used a quota sample to match the proportions of capital cities on gender, age, in Korea and Japan for 2 months—from December in 2018 to January in 2019. The participants were provided with written statements stating the purpose of the survey, and the usage and management of the data that they would provide. Data was collected only from the participants who agreed to the statements. During the survey period, 340 Korean and 253 Japanese consumers responded to the survey. Finally, consumer data from 339 Koreans and 248 Japanese were used for the analysis, after removing poor survey data.

A quantitative survey was developed with the objective of exploring three issues regarding sustainable consumption. First, respondents assessed 57 separate activities and the extent to which they were perceived as “sustainable consumption.” The 57 activities were selected from the studies by Son et al. (2010) [63], Song et al. (2010) [64], Rettie et al. (2012) [5], Yoo (2013) [65], and Larson et al. (2015) [66]. Respondents were asked “To what extent do you think that these activities are sustainable behavior?” and were given a 7 point Likert scal., from 1 point for “not at all” to 7 points for “very sustainable consumption.” After the factor analysis, these items were reduced into 7 dimensions with 47 activities. Second, respondents assessed the same separate activities and the extent to which they were perceived as “normal” behavior in their communities or societies. In the survey a second question asked, “To what extent do you think that these activities are normal (what people in your society generally do)?”, using the 7 point Likert scal., from 1 point for not at all normal to 7 points for very normal. Third, respondents assessed the same 57 separate activities and the extent to which they actually have practiced in their daily lives. Finally, respondents were asked, “To what extent do you think that you actually perform these activities?”, using the same scale as the 7 Likert scale.

To measure internal variables such as “pro-environmental self-identity” and “attitude”, the survey captured the extent to which respondents believed sustainable consumption desirable and preferable, as well as how they perceived themselves to be an “environmentally friendly” person, by asking questions such as “am I am eco-friendly consumer” and “am I a consumer who is concerned with environmental issues.” All the questions were measured with Likert-type scale ranging from 1 (not at all likely) to 7 (extremely likely). In addition to these questions, the following demographic variables were collected in the survey: age, sex, marital status, occupation, region, level of education, and income level.

The validity and reliability of the selected data were examined, and we also conducted the quantitative analysis to meet the purpose of the study, by using SPSS 24.0. Through the descriptive analysis, we present the status and perspectives of sustainable consumption, mainly focusing on the room for further development in terms of consumers’ practice and perceptions. This study ultimately develops an approach to sustainable consumption behaviors in relation with consumers’ awareness, attitudes, self-concept and perceived normalization. In order to specifically illustrate the adoption of sustainable consumption behaviors which can be influenced by the major components, we conducted hierarchical regression analysis: at the first level, the effect of major demographic factors on practical sustainable consumption are examined, and at the second level, the major independent variables of consumer’s attitude, pro-environmental self-identity, awareness, and the descriptive norm are added to elaborate the behavioral models.

The fundamental questions that motivated this paper are:

1. How do consumers in Korea and Japan assess common sustainability-related activities and the extent to which they are sustainable consumption, and the extend to which they are normal? How do they assess the extent to which they actually have practiced them?

2. How do consumers in each country assess the 7 factors of sustainable consumption and the extent to which they are sustainable consumption, and the extend to which they are normal? How do they assess the extent to which they actually have practiced them in their daily lives?
3. How do consumers' characteristics affect the practice of sustainable consumption? How do consumer's attitude, pro-environmental self-identity, awareness, and descriptive norms affect the practice of sustainable consumption?

5. Results and Analysis

5.1. Characteristics of Respondents

The survey was conducted on individual consumers in their 20s to 60s, living in the capital cities of each country. Conducted for Korean and Japanese consumers, there remained 339 Korean and 248 Japanese respondents in the final analysis, excluding inadequate responses.

The ratio of male and female respondents were relatively even (Figure 1). While most of the Korean sampling was done for respondents in their 30s to 40s, sampling of Japanese respondents was relatively uniform. There were more married respondents than singles. In terms of education level, graduates occupied the highest proportion. As for household income per month, over half of both Korean and Japanese respondents earned \$1800 or more but less than \$5400.

		Korea (N=339)		Japan (N=248)				Korea (N=339)		Japan (N=248)	
		N	%	N	%			N	%	N	%
Gender	male	168	49.56	125	50.40	Education level	Under the high school/High school	42	12.39	78	31.45
	female	171	50.44	123	49.60		College/University	239	70.50	146	58.87
Age	20's	59	17.40	48	19.35		Graduate/professional raining	58	17.11	24	9.68
	30's	106	31.27	50	20.16	Household Income per a Month	Less than \$1,800	30	8.85	29	11.69
	40's	102	30.09	49	19.76		Less than \$3,600	119	35.10	80	32.26
	50's	36	10.62	49	19.76		Less than \$5,400	93	27.43	58	23.39
	60's	36	10.62	52	20.97		Less than \$7,200	50	14.75	30	12.10
Marital Status	married	192	56.64	127	51.21		More than \$7,200	47	13.86	51	20.56
	single	147	43.36	121	48.79						

Figure 1. Characteristics of the respondents.

5.2. Exploratory Factor Analysis, Reliability, and Correlations

We submitted the 57 items which measured consumers' awareness of sustainable consumption, to a principal-components factor analysis with varimax rotation and an eigenvalue greater than 1. This procedure led to the retention of 7 factors with 47 items, in terms of whether sufficient numbers of items had a factor loading greater than 0.40. The factors pertaining to sustainable consumption are labeled (a) Purchasing eco-labeled products (4 items), (b) Consumer Citizenship (10 items), (c) Saving resources/energy (3 items), (d) Environment-friendly usage and disposal (15 items), (e) Use of Environment-friendly packaging (5 items), (f) Recognition of sustainability- related policies (5 items), (g) Environment friendly driving habits (5 items).

In addition, other factors related to individual's personal characteristics were labeled the resultant factors as (h) Attitude toward sustainable consumption (3 items), (i) Pro-environmental self-identity related to sustainability (4 items).

The internal consistency reliability estimates with Cronbach's alpha were high, ranging from 0.85 to 0.96 for 9 factors. Examination of the correlations among the factors (not listed here) showed that most variables were moderately to highly inter-correlated (average range of Pearson's correlations = 0.50–0.85).

5.3. Consumers' Activities on the Sustainable, Normal and Practical Scales

Respondents assessed a range of activities and the extent to which they were sustainable consumption, or normal, and the extent to which they actually have been practiced. Figure 2 shows the mean scores for each activity. In this table, red blocks represent consumers' responses to the sustainable activity being less than the median value—essentially identifying the specific sustainable-related activities that have room for improvement in terms of consumer perception and practice.

Activities scoring highly on the awareness of sustainable consumption scale include “to separate recyclable materials”, “to use reusable bags (eco bags) instead of plastic bags” while “to discuss environmental issues”, “to understand carbon emission labels and ecological footprint”, “to voice my own opinions on the environment”, “to join local environmental movements” are low both in Korea and Japan. Although there were deviations in the average scores, the scores for all the activities were higher than median. This indicates that consumers in both countries are well aware of—and have knowledge on—sustainable consumption.

Activities scoring highly on the normal scale include “to separate recyclable materials”, “to purchase energy-saving mark (labeled) products”, while “to discuss environmental issues”, “to join/support environmental actions”, “to join local environmental movements”, “to understand carbon emission labels and ecological footprints” are seen as not normal in the two countries. In short, Korean and Japanese consumers rarely perceive that participation in civic activities as a consumer citizen is socially normalized. Examining the differences between the two countries, while most scores of activities related to “use of environment-friendly packaging” are below the median in Korea, most scores of activities related to “recognition of sustainability-related policies” are below the median in Japan.

Activities scoring highly on the practical behavior scale include “to separate recyclable materials”, “to commute by public transportation” both in Korea and Japan. Conversely, scores of most activities categorized in consumer citizenship for both countries are less than 4 points. The activities of “to voice my own opinions on environment”, “to discuss environmental issues” are the lowest. However, the notable difference between the two countries indicates that the Japanese are relatively less likely to purchase products based on the environmental markings on products or packages, even while actively purchasing products with energy-saving markings.

5.4. Current Status of Sustainable Consumption

Figure 3 shows the mean scores for 7 factors of sustainable consumption and significant differences between Korea and Japan.

The result shows that scores of awareness of “saving resources/energy”, “environment-friendly usage and disposal”, “use of environment-friendly packaging” are the highest, while “consumer citizenship” is the lowest both in Korea and Japan. In addition, recognition of “purchasing eco-labeled products” and “recognition of sustainability-related policies” are also low in the two countries. Although there are some differences in the perception of sustainable consumption, respondents recognize the environmentally friendly consumption behavior, as all the scores are above the median.

Factors of Sustainable consumption		Awareness				Descriptive Norms (Normalization)				Practical Behavior			
		Korea	rank	Japan	rank	Korea	rank	Japan	rank	Korea	rank	Japan	rank
(a) Purchasing eco-labeled products	Purchase eco mark(labeled) products	4.93	41	4.74	27	4.68	11	4.23	23	4.47	32	3.72	32
	Purchase low carbon mark(labeled) products	4.91	43	4.67	32	4.43	17	3.94	30	4.26	35	3.48	35
	Purchase energy-saving mark(labeled) products	5.42	26	4.96	17	5.17	2	4.86	3	5.14	13	4.34	17
	Purchase environmentally friendly agriculture mark products	4.99	36	4.75	26	5.02	4	4.34	19	4.61	25	3.91	28
(b) Consumer citizenship	Pay for environmental pollution(Pollution charges)	4.88	44	4.45	36	4.00	34	3.51	38	4.09	36	3.04	40
	Join the Environmental Movement	5.11	33	4.42	39	4.01	33	3.51	39	3.85	41	2.86	43
	Reject leather products	4.93	42	4.38	40	3.75	42	3.64	36	4.54	27	3.90	29
	Support environmental policies	5.17	31	4.50	34	3.91	38	3.60	37	4.04	38	3.13	39
	Support environmental petitions	4.98	37	4.28	44	3.94	37	3.48	41	4.04	39	2.97	41
	Donate to protect/improve the local environment	4.96	38	4.44	37	3.70	45	3.50	40	3.69	45	2.96	42
	Voice my own opinions on environment	4.94	40	4.27	45	3.78	41	3.38	43	3.72	43	2.81	45
	Discuss environmental issues	4.80	46	4.19	47	3.70	46	3.29	46	3.64	46	2.72	46
	Join/Support environmental actions	4.95	39	4.32	41	3.72	44	3.34	45	3.78	42	2.83	44
	Join local environmental movements	4.85	45	4.29	43	3.67	47	3.27	47	3.63	47	2.70	47
(c) Saving resources /energy	Cut off standby power	5.57	15	4.81	22	4.96	6	4.53	8	5.36	5	4.47	13
	Maintain ideal room temperature during summer and winter	5.53	18	4.96	18	4.75	9	4.68	4	5.28	9	4.70	7
	Save water(Conserve water)	5.58	14	5.11	3	4.47	14	4.63	6	5.07	17	4.62	9
(d) Environment -friendly usage and disposal	Separate recyclable materials	5.94	2	5.29	1	5.29	1	5.15	1	5.74	1	5.24	1
	Commute by public transportation	5.44	25	4.72	29	4.88	7	4.64	5	5.43	3	4.97	3
	Commute by bicycle	5.48	24	5.00	11	4.19	29	4.37	18	3.72	44	3.69	33
	No food left to prevent wasted food	5.68	10	5.10	4	4.40	19	4.41	14	5.14	14	5.18	2
	Reduce single-use items	5.94	3	4.97	14	4.40	20	4.39	16	4.99	18	4.53	11
	Reduce plastic use	5.96	1	5.08	7	4.28	24	4.21	24	4.82	22	4.23	21
	Reduce use of synthetic detergent	5.75	9	4.76	25	4.10	31	3.94	31	4.65	24	4.06	27
	Reduce food waste	5.81	7	4.82	20	4.40	21	4.14	27	5.09	16	4.33	18
	Use personal bags instead of plastic bags	5.92	5	4.71	30	4.86	8	4.60	7	5.47	2	4.73	6
	Use reusable bags(eco bags) instead of plastic bags	5.93	4	5.23	2	4.63	12	4.90	2	5.22	10	4.96	4
	Use tumblers instead of disposable cups	5.92	6	5.10	5	4.45	16	4.33	21	4.99	19	4.32	19
	Receive electronic receipts instead of papers	5.52	20	4.97	15	4.74	10	4.52	9	5.36	6	4.76	5
	Donate/Share unused items	5.49	22	4.90	19	4.39	22	4.15	26	4.58	26	3.77	31
	Reuse papers, plastic bags, etc	5.63	11	4.97	16	4.46	15	4.39	17	5.14	15	4.65	8
Purchase recycled products	5.28	29	4.78	24	4.42	18	4.46	11	4.49	28	4.07	26	
(e) Use of Environment -friendly packaging	Avoid overpacking and overpacking products	5.62	12	5.09	6	3.89	39	4.43	12	4.43	33	4.49	12
	Choose/Use recyclable materials(products) in packaging	5.55	17	5.02	8	3.99	35	4.40	15	4.49	29	4.21	22
	Choose/Use reusable materials(products) in packaging	5.53	19	5.01	9	3.98	36	4.42	13	4.48	30	4.16	24
	Choose/Use renewable plastics(products) in packaging	5.38	27	4.98	13	4.10	32	4.34	20	4.48	31	4.13	25
	Choose/Use biodegradable or compostable materials in packaging	5.60	13	5.01	10	3.83	40	4.09	28	4.08	37	3.67	34
(f) Recognition of sustainability -related policies	Be aware of climate change and risks	5.50	21	4.56	33	4.99	5	4.48	10	5.22	11	4.42	16
	Understand environmental labels	5.01	34	4.44	38	4.26	26	3.68	35	4.36	34	3.48	36
	Understand carbon emission labels and ecological footprints	4.71	47	4.23	46	3.73	43	3.38	44	3.96	40	3.28	37
	Understand energy efficiency labels	5.38	28	4.30	42	5.09	3	3.41	42	5.21	12	3.28	38
Be aware of peak and off peak electricity times	5.00	35	4.50	35	4.60	13	3.93	32	4.78	23	3.89	30	
(g) Environment friendly driving habits	Avoid sudden acceleration and braking	5.49	23	4.82	21	4.36	23	4.17	25	5.33	8	4.43	15
	Maintain a steady speed	5.56	16	4.80	23	4.20	28	4.05	29	5.35	7	4.47	14
	Avoid unnecessary idling	5.76	8	5.00	12	4.28	25	4.27	22	5.41	4	4.55	10
	Check tire pressure regularly	5.15	32	4.68	31	4.25	27	3.92	33	4.96	20	4.17	23
	Do not carry any unnecessary weight	5.22	30	4.74	28	4.16	30	3.84	34	4.94	21	4.28	20

Figure 2. Activity mean scores. Red blocks represent consumers’ responses to the sustainable activity being less than the median value.

Descriptive norm of “purchasing eco-labeled products” is the highest in Korea, which implies that it is seen as a mostly normalized sustainable consumption by Korean consumers. Conversely, consumption behavior of “saving resources and energy” is seen as the most normal in Japan. For both countries, sustainable consumption behavior of “saving resources and energy”, “environment-friendly usage and disposal”, “environment-friendly usage and disposal” are highly perceived as normal. However, scores of descriptive norm of “use of environment-friendly packaging in Korea”, and “recognition of sustainability-related policies in Japan” are below the median, respectively. Also, the scores of “consumer citizenship” on both descriptive norm and practical behavior scales are less

than 4 point both in Korea and Japan, even though it is clearly seen as sustainable consumption. Meanwhile, the Japanese mean of the degree of perceived normal of “use of environment-friendly packaging” is higher than Koreans, while other mean scores are slightly lower than Korea. The Japanese are well known to be scrupulous about recycling PET bottles. According to the Council for PET Bottle Recycling, 93.5% of PET bottles distributed nationwide were recycled in Japan in 2014. Although Japan is one of the world’s largest producers of plastic packaging waste per capita, this is a successful example of the responsibility for recycling used PET bottles being embraced by manufacturers. Even though no regulatory bans exist in place on single use plastic, Japan accounts for relatively limited leakages of single-use plastics in the environment due to an effective waste management system and a high degree of social consciousness [67].

Factors of Sustainable consumption	Awareness of sustainable consumption				Descriptive Norms (Normalization)				Practical Behavior			
	Korea	rank	Japan	rank	Korea	rank	Japan	rank	Korea	rank	Japan	rank
	M(sd)	-ing	M(sd)	-ing	M(sd)	-ing	M(sd)	-ing	M(sd)	-ing	M(sd)	-ing
(a) Purchasing eco-labeled products	4.99 (0.89)	6	4.77 (1.00)	5	4.80 (1.00)	1	4.36 (0.94)	3	4.60 (0.98)	5	3.90 (1.22)	5
(b) Consumer citizenship	4.95 (0.92)	7	4.36 (1.03)	7	3.82 (1.15)	7	3.45 (1.18)	7	3.90 (1.29)	7	2.99 (1.37)	7
(c) Saving resources/energy	5.56 (0.99)	2	4.96 (1.11)	2	4.73 (1.01)	2	4.61 (1.10)	1	5.24 (1.00)	1	4.59 (1.30)	1
(d) Environment-friendly usage and disposal	5.71 (0.82)	1	4.96 (0.97)	2	4.53 (0.97)	3	4.44 (0.91)	2	4.99 (0.82)	4	4.50 (0.94)	2
(e) Use of environment-friendly packaging	5.54 (0.98)	3	5.02 (1.13)	1	3.96 (1.29)	6	4.33 (1.08)	4	4.39 (1.20)	6	4.13 (1.18)	4
(f) Recognition of sustainability-related policies	5.12 (.88)	5	4.41 (1.05)	6	4.53 (0.94)	3	3.77 (1.10)	6	4.71 (0.96)	3	3.67 (1.22)	6
(g) Environment friendly driving habits	5.44 (0.88)	4	4.81 (0.99)	4	4.25 (1.15)	5	4.05 (0.98)	5	5.20 (0.94)	2	4.38 (0.99)	3
Total Average	5.32 (0.04)		4.75 (0.06)		4.37 (0.05)		4.15 (0.05)		4.68 (0.04)		3.99 (0.06)	

Figure 3. Mean scores of awareness, descriptive norm, practical behavior of sustainable consumption in Korea and Japan.

“Saving resources/energy” is the most frequently performed behavior by consumers, while “consumer citizenship” is the least performed in both countries. Followed by “consumer citizenship”, “use of environment-friendly packaging” and “purchasing eco-labeled products” are the lowest, respectively in Korea, while “recognition of sustainability-related policies” and “purchasing eco-labeled products” are shown to be the least practiced in Japan.

Figure 4 displays the sustainable consumption ratings along the two axes: “consumers’ awareness” which was measured from “not at all sustainable” to “very sustainable” consumption, and “descriptive norm”, being measured from “not at all normal” to “very normal.” Depicting the factors of sustainable consumption on these scales shows how each country’s consumers currently understand sustainable consumption. More practically, it facilitates the identification of educational and political strategies to promote more sustainable behaviors by individual consumers. As a result, consumers in both countries are well aware of various types of sustainability-related consumption behavior.

However, not all types of sustainable consumption are perceived as socially normalized. The behaviors in the 4 quadrant shows that although sustainable consumption is properly understood and favorably perceived by consumers, it cannot be normally activated in society due to various reasons. As shown in Figure 4, “consumer citizenship”, “use of environment-friendly packaging”, “recognition of sustainability-related policies” are perceived as being environmentally friendly but as less socially normal. That is, there is scope to spread the descriptive norms of these sustainable consumption behaviors.

Figure 5 displays the sustainable consumption ratings along the two axes, descriptive norm and practical behavior performed by consumers. Quadrant 3 in this figure—which implies lacking

in recognition of both descriptive norm and practical behavior-shows behaviors of sustainable consumption that social expansion is needed through policies or education and PR. In both nations, since consumer citizenship belongs to quadrant 3, it reveals a need for preparing various programs and arenas for public opinion to induce consumer participation along with education for increasing recognition of the importance of consumer citizenship. Besides, levels of both generalization and practice of “recognition of sustainability-related policies” are lower in Japanese respondents, indicating a need for preparing policies of sustainable consumption and giving consumers PR for its correct recognition.

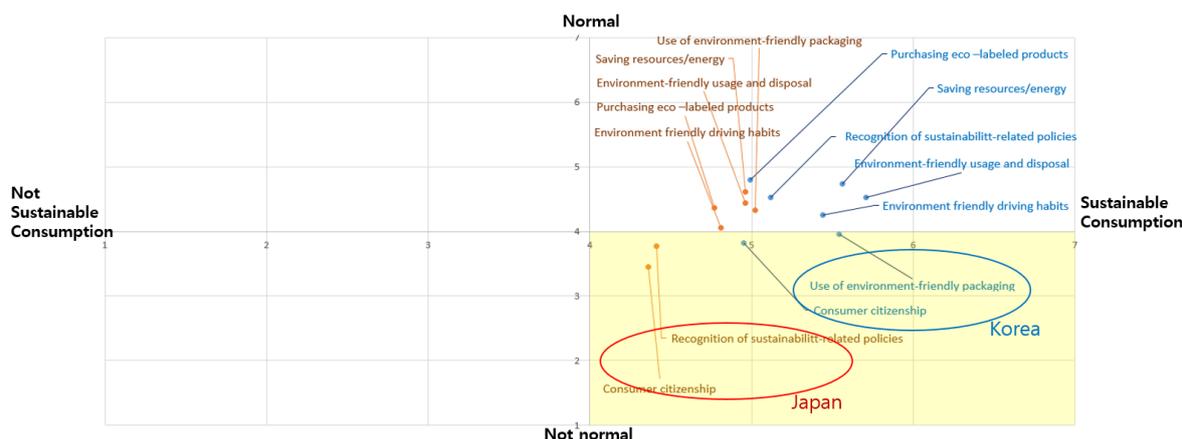


Figure 4. Graphical representation of sustainable consumption ratings (descriptive norm-awareness).

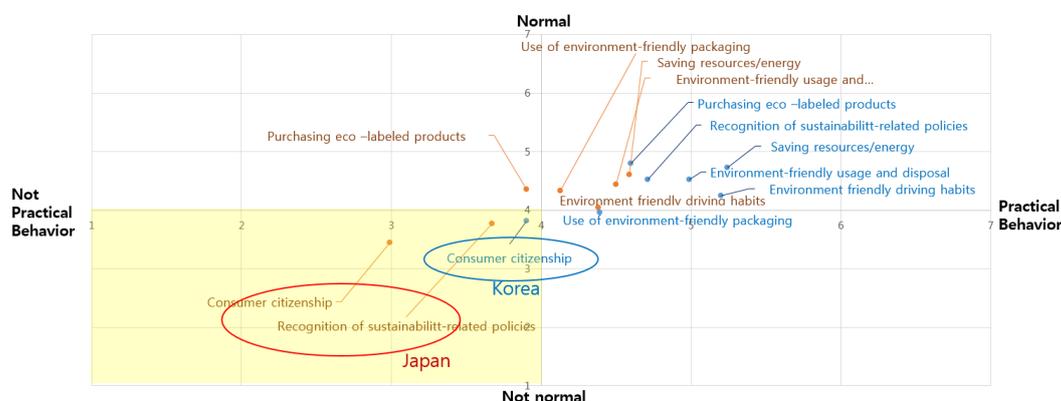


Figure 5. Graphical representation of sustainable consumption ratings II (descriptive norm-practical behavior scale).

Conversely, quadrant 2 shows Japanese consumers have relatively positive recognition of descriptive norm for “Purchasing eco-labeled product” but lack in practical behavior. As increased self-efficacy is known to lead the change of individual’s behavior by reducing the discrepancy related to actual behavior, there is a need for raising consumer efficacy and practice through constant promotion for positive outcome from purchase and use of an eco-labeled product [68].

5.5. Models of Sustainable Consumption Behavior

In order to explain each practical behavior of sustainable consumption performed by consumers through the regression models, we analyzed the variables of consumers’ attitude and pro-environmental self-identity, along with the awareness and descriptive norm of 7 different types of sustainable consumption. Descriptive analysis was conducted prior to the regression analysis, and the results (Figure 6) reveals that Korean consumers have more positive attitude and pro-environmental

self-identity than the Japanese while the scores of pro-environmental self-identity were less than 4 points in both Korea and Japan.

		Mean	S/D
Attitude toward sustainable consumption behavior	Korea	4.22	0.63
	Japan	3.65	0.78
Pro-environmental self-identity	Korea	3.62	0.65
	Japan	3.24	0.91

Figure 6. Difference in attitude and environmental self-identity between Korea and Japan.

The details of the analysis are as follows. A 2-step of hierarchical multiple regression analysis was conducted using seven factors of the practice of sustainable consumption as dependent variables. At the first level, we examined the effect of major demographic factors on each dependent variable, the 7 factors of practical sustainable consumption. At the second level, variables of consumer's attitude, pro-environmental self-identity, awareness, and the descriptive norm were added as major independent variables.

Korean consumers' results (Figure 7) showed that the explanatory power of the models became consistently higher when major independent variables were included, than models with only demographic variables. The first-level regression model, which was conducted only with demographic variables, showed that age had a significant effect on all types of sustainable consumption behaviors; however, the magnitude of the influence was relatively small compared to the major variables. Gender also had significant impact on behaviors related to resource saving—using eco-packaging and consumer citizenship—but its effect disappeared in step 2 of the regression analysis, except for consumer citizenship. The detailed results of final regression models for each consumption behavior are as follows.

- (a) Korean consumers tend to purchase eco-labeled products depending on how much purchasing of eco-labeled products is perceived as normalized, since the descriptive norm was analyzed to have the strongest effect. As with the descriptive norm, pro-environmental self-identity and awareness were analyzed to have significant effects.
- (b) The descriptive norm of consumer citizenship was the most positively influential variable, and awareness of consumer citizenship was analyzed to have the second strongest impact on the practice of consumer citizenship. Meanwhile, there were impacts of demographic variables; male consumers and consumers who are older tend to actively practice consumer citizen related behavior.
- (c) The practical behavior of energy and resources saving was positively affected by consumers' awareness and descriptive norm of resource conservation, pro-environmental self-identity, and age, in that order, indicating that the higher the levels of awareness, descriptive norm, and self-identity, the higher the level of energy saving behavior that consumers perform. In addition, energy-resources saving behavior is more actively practiced by older consumers.
- (d) Consumption behavior toward environment-friendly usage and disposal was analyzed to be most affected by the descriptive norm, followed by awareness and self-identity. In addition, there was the effect of age: older consumers were more likely to practice environmentally friendly usage and disposal.
- (e) The most positively influential variable was the descriptive norm of use of eco-friendly packaging, followed by pro-environmental self-identity. The result also indicated that the older the consumers are, the more actively they use environmentally friendly packaging materials and goods.
- (f) The perceived normalization level of recognizing sustainability-related policies has the greatest impact on consumers in realizing sustainable-related policies and practicing sustainable consumption behavior. Following this, consumers' awareness and age were also analyzed to have positive and strong effects; older consumers tended to perform behaviors with the recognition of sustainable-related policies.

- (g) Consumers’ awareness of eco-friendly driving has the strongest effect on having environment friendly driving habits, and the second most influential factor was the descriptive norm. Both variables were shown to have significantly positive impact on practical eco-driving.

Overall., the results showed that Korean consumers’ practice of each sustainable consumption behavior were greatly affected by descriptive norm, while there were no significant effects of attitude on behaviors of sustainable consumption. Meanwhile, consumers’ awareness was shown to be most important for the behaviors related to resources-energy saving and environment-friendly driving.

		(a)		(b)		(c)		(d)		(e)		(f)		(g)		
		Purchasing eco-labeled products		Consumer citizenship		Saving resources/energy		Environment-friendly usage and disposal		Use of Environment-friendly packaging		Recognition of sustainability-related policies		Environment friendly driving habits		
		B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	B ¹⁾	β ²⁾	
1	(constant)	3.778		3.444		3.868		4.425		3.850		3.503		4.064		
	Gender	female	-0.175	-0.089	-0.441	-0.172**	0.230	0.115*	0.060	0.087	0.263	0.110*	-0.044	-0.023	0.101	0.053
	Marital status	single	0.056	0.028	-0.020	-0.008	0.194	0.096	0.104	0.063	0.095	0.039	-0.012	-0.006	0.147	0.073
	Age		-0.016	0.189**	0.017	0.150*	0.023	0.260***	0.015	0.204**	0.020	0.195*	0.023	0.273***	0.014	0.166*
	Education level	College/University	0.004	0.002	-0.284	-0.101	-0.019	-0.009	-0.208	-0.116	-0.305	-0.116	0.012	0.006	-0.082	-0.039
		Graduate/professional training	0.195	0.075	-0.155	-0.046	0.113	0.042	-0.029	-0.013	-0.137	-0.043	0.129	0.051	-0.008	-0.003
	income level	Less than \$3,600	0.094	0.046	0.065	0.024	0.209	0.099	-0.022	-0.013	-0.171	-0.068	0.185	0.093	0.483	0.255
		Less than \$5,400	0.365	0.166	0.474	0.165	0.370	0.165	0.125	0.068	0.196	0.073	0.422	0.197*	0.598	0.294
		Less than \$7,200	0.199	0.072	0.341	0.094	0.187	0.066	0.097	0.042	0.168	0.050	0.306	0.114	0.625	0.242
		More than \$7,200	0.174	0.061	0.191	0.051	0.244	0.084	0.054	0.023	0.142	0.041	0.335	0.121	0.375	0.154
2	(constant)	0.379		-0.990		-0.152		0.363		0.062		-0.591		0.109		
	Gender	female	-0.099	-0.050	-0.213	-0.083*	0.112	0.056	-0.006	-0.004	-0.098	0.041	-0.065	-0.034	0.028	0.015
	Marital status	single	0.071	0.036	-0.080	-0.012	0.162	0.080	0.071	0.043	0.087	0.036	-0.077	-0.040	-0.007	-0.003
	Age		0.006	0.076	0.010	0.088*	0.010	0.109*	0.008	0.110*	0.013	0.129*	0.011	0.129**	-0.002	-0.023
	Education level	College/University	0.192	0.089	0.109	0.039	0.160	0.073	-0.084	-0.047	-0.155	-0.059	0.135	0.065	0.299	0.142
		Graduate/professional training	0.120	0.046	0.045	0.013	0.192	0.072	0.011	0.005	-0.150	-0.047	0.128	0.051	0.229	0.093
	income level	Less than \$3,600	0.058	0.028	-0.040	-0.015	0.035	0.017	-0.117	-0.068	-0.291	-0.116	0.150	0.075	0.245	0.119
		Less than \$5,400	0.169	0.077	0.095	0.033	0.051	0.023	-0.017	-0.009	-0.054	-0.020	0.249	0.116	0.163	0.081
		Less than \$7,200	0.029	0.010	-0.110	-0.080	-0.113	-0.040	-0.124	-0.054	-0.131	-0.089	0.192	0.071	0.204	0.079
		More than \$7,200	0.110	0.039	0.057	0.015	-0.086	-0.012	-0.091	-0.088	-0.006	-0.002	0.184	0.067	0.105	0.043
Attitude		-0.107	-0.068	-0.171	-0.083	0.075	0.047	0.108	0.083	0.134	0.070	0.067	0.044	0.065	0.043	
Pro-environmental Self identity		0.224	0.149**	0.159	0.081	0.210	0.136*	0.152	0.121*	0.271	0.147*	0.130	0.089	0.194	0.126	
Awareness (of each practical behavior)		0.158	0.143*	0.424	0.302***	0.412	0.407***	0.346	0.348***	0.106	0.086	0.325	0.301***	0.567	0.530***	
Descriptive norm (of each practical behavior)		0.538	0.549***	0.673	0.600***	0.287	0.289***	0.317	0.374***	0.487	0.521***	0.488	0.479***	0.155	0.190***	
F-value (model 1)		2.418*		3.174**		2.688**		2.087*		2.965**		4.274***		1.182		
F-value (model 2)		25.281***		40.961***		22.889***		24.238***		17.493***		40.247***		15.992***		
R ² (model 1)		0.062		0.080		0.069		0.054		0.075		0.105		0.047		
R ² (model 2)		0.503		0.621		0.478		0.492		0.412		0.617		0.496		
Δ R ²		0.441		0.541		0.409		0.438		0.337		0.512		0.449		

p<0.05*, p<0.01**, p<0.001***

1) Unstandardized coefficients

2) Standardized coefficients

Figure 7. Regression models for practices of each sustainable consumption behavior (Korea).

We also conducted a 2-step regression analysis to explain 7 different types of practical behavior of sustainable consumption for Japanese consumers. The results of first-level regression analysis showed

(Figure 8), contrary to the Korean results, there was no consistent effect of age on Japanese consumers' sustainable behaviors. However, gender was analyzed to have an impact on behaviors even in stage 2 of the regression model, involving major variables. The detailed results of final regression models for each consumption behavior are as follows.

- (a) Japanese consumers tend to choose eco-labeled products mostly depending on the degree of pro-environmental self-identity. Following this, descriptive norm and attitude toward purchasing eco-labeled products were analyzed to have positive effect on consumption behavior.
- (b) The descriptive norm of consumer citizenship was the most positively influential variable, and pro-environmental self-identity was analyzed to have the second strongest impact on the practice of consumer citizenship. In addition, male consumers were shown to be more active in civic activities as consumer citizens than females.
- (c) The practical behavior of energy-resources saving was positively affected by consumers' descriptive norm of resource conservation, awareness, and pro-environmental self-identity in that order. In addition, energy-resources saving behavior is more actively practiced by female consumers.
- (d) Environment-friendly usage and disposal were analyzed to be most strongly affected by descriptive norm, followed by self-identity, and awareness. In addition, consumers who are female and belong to the group with the highest income level, were analyzed to be more likely to be active in environmentally friendly usage and disposal.
- (e) Pro-environmental self-identity and descriptive norm of use of environment-friendly packaging were shown as significant variables, in that order.
- (f) Perceived normalization level of recognizing sustainability-related policies had the greatest impact on consumers in realizing sustainable-related policies, and practicing sustainable consumption behavior. Following this, consumers' pro-environmental self-identity, attitude, education level and age were also analyzed to have positively strong effect, indicating that the recognition and practice of sustainability-related policies are better implemented by consumers who have highly perceived descriptive norm, pro-environmental self-identity, attitude as well as consumers with high levels of education and older age.
- (g) Descriptive norm of eco-friendly driving has the strongest effect on having environment friendly driving habits, with the second most influential factor being awareness, with both variables shown to have significantly positive impact on practical eco-driving. In addition, consumers who are female and older are more likely to be drive in an environmentally friendly way.

Overall, the results show that Japanese consumers' practices of each sustainable consumption behavior were greatly affected by the descriptive norm, with exceptions for "purchasing eco-labeled products" and "use of environment-friendly packaging". For those behaviors, the effect of pro-environmental self-identity was the greatest. Attitudes had significant effects on behaviors such as "purchasing eco-labeled products" and "recognition of sustainability-related policies", while Koreans were not affected by attitudes at all. On the other hands, the behaviors related to saving resources-energy, environment-friendly usage and disposal of goods and driving habits were analyzed to be influenced by awareness, both for Japanese and Koreans.

		(a)		(b)		(c)		(d)		(e)		(f)		(g)		
		Purchasing eco-labeled products		Consumer citizenship		Saving resources/energy		Environment-friendly usage and disposal		Use of Environment-friendly packaging		Recognition of sustainability-related policies		Environment friendly driving habits		
		B 1)	β 2)	B 1)	β 2)	B 1)	β 2)	B 1)	β 2)	B 1)	β 2)	B 1)	β 2)	B 1)	β 2)	
1	(constant)	3016		2620		3941		3891		3358		2779		3.131		
	Gender	female	0.046	0.019	-0.023	-0.0154*	0.619	0.239***	0.398	0.211**	0.238	0.101	-0.137	-0.056	0.480	0.218*
	Marital status	single	-0.168	-0.067	-0.052	-0.019	-0.252	-0.097	-0.220	-0.117	-0.113	-0.048	-0.138	-0.057	0.171	0.085
	Age		0.014	0.185**	0.008	0.090	0.005	0.065	0.003	0.057	0.012	0.165	0.015	0.195**	0.016	0.240*
	Education level	College/University	0.030	0.012	-0.017	-0.006	0.391	0.148	0.139	0.073	-0.026	-0.011	0.191	0.077	0.158	0.078
		Graduate/professional training	0.298	0.071	0.025	0.005	0.505	0.115	0.300	0.094	0.310	0.078	0.561	0.136	0.906	0.270*
	income level	Less than \$3,600	0.392	0.151	0.394	0.202	-0.004	-0.002	0.373	0.185	0.241	0.095	0.292	0.112	0.077	0.084
		Less than \$5,400	0.152	0.053	0.190	0.059	0.046	0.015	0.209	0.094	0.037	0.013	0.136	0.047	-0.140	-0.060
		Less than \$7,200	0.491	0.132	-0.049	-0.012	0.109	0.027	0.294	0.102	0.143	0.039	0.185	0.050	0.702	0.242
		More than \$7,200	0.083	0.027	0.116	0.034	-0.378	-0.118	0.215	0.092	0.108	0.037	0.099	0.033	0.122	0.058
2	(constant)	0.079		0.216		0.309		0.156		0.049		-0.224		1.273		
	Gender	female	-0.074	-0.030	-0.234	-0.085*	0.238	0.099*	0.247	0.131**	0.191	0.081	-0.085	-0.085	0.423	0.192*
	Marital status	single	-0.125	-0.051	-0.108	-0.039	-0.134	-0.051	-0.022	-0.011	0.081	0.034	0.040	0.016	0.056	0.028
	Age		0.003	0.044	-0.001	-0.010	-0.003	-0.051	-0.002	-0.038	0.005	0.064	0.006	0.077*	0.013	0.197*
	Education level	College/University	-0.208	-0.084	-0.061	-0.022	0.018	0.007	0.034	0.018	-0.193	-0.080	0.059	0.024	0.107	0.053
		Graduate/professional training	-0.073	-0.018	-0.126	-0.027	-0.038	-0.009	0.075	0.023	-0.052	-0.013	0.322	0.078*	0.357	0.106
	income level	Less than \$3,600	0.139	0.054	0.471	0.161	-0.098	-0.035	0.220	0.109	0.151	0.060	0.092	0.035	-0.066	-0.024
		Less than \$5,400	-0.005	-0.002	0.338	0.104	0.076	0.025	0.235	0.106	0.106	0.038	0.088	0.031	-0.224	-0.095
		Less than \$7,200	0.079	0.021	-0.201	-0.048	0.052	0.013	0.076	0.026	-0.039	-0.016	-0.065	-0.017	0.512	0.176
		More than \$7,200	0.018	0.006	0.327	0.096	-0.254	-0.079	0.305	0.131*	0.315	0.108	0.169	0.056	0.089	0.042
Attitude		-0.226	0.144*	-0.195	-0.111	-0.126	-0.075	0.023	0.019	-0.175	-0.115	-0.283	0.181***	-0.239	-0.169	
Pro-environmental Self identity		0.639	0.490***	0.416	0.275***	0.251	0.175**	0.319	0.307***	0.582	0.446***	0.388	0.289***	0.234	0.183	
Awareness (of each practical behavior)		0.024	0.020	-0.132	-0.099	0.355	0.302***	0.264	0.271***	0.118	0.113	0.092	0.079	0.231	0.232**	
Descriptive norm (of each practical behavior)		0.553	0.428***	0.781	0.668***	0.494	0.419***	0.379	0.364***	0.432	0.394***	0.761	0.684***	0.300	0.298**	
F-value (model 1)		1.713*		1.589*		2.742**		2.426*		1.431		1.760*		2.415*		
F-value (model 2)		22.434***		23.234***		25.268***		39.686***		20.210***		51.925***		4.524***		
R ² of first model		0.061		0.057		0.094		0.084		0.051		0.027		0.185		
R ² of second model		0.555		0.564		0.584		0.688		0.529		0.728		0.390		
Δ R ²		0.494		0.507		0.490		0.604		0.478		0.680		0.205		

p < 0.05*, p < 0.01**, p < 0.001***
 1) Unstandardized coefficients
 2) Standardized coefficients

Figure 8. Regression models for practices of each sustainable consumption behavior (Japan).

6. Conclusions

Having noted that “sustainability” is one of the common priority issues today, this paper explored the status of sustainable consumption in Korea and Japan. The study worked on two levels: on one level, it is a study of sustainability-related consumer activities and behaviors in Korea and Japan; on another level, it tests models to explain each sustainable consumption

behavior based on revised TRA, considering relevant variables such as awareness, descriptive norm, and pro-environmental self-identity.

An important finding of this research is that consumer awareness of sustainable consumption is appropriately recognized in both countries. This indicates that consumers already understand sustainable consumption, so that their failure to practically perform sustainability-related activities cannot be explained to knowledge deficit. Other descriptive findings which shows the sectors needing priority in improvement and ideation by modelling of each country are as follows. First, consumer citizenship is an area of activity which has received relatively little publicity and lack of practical behavior of consumers in two countries. Second, both descriptive norm and practice of “recognition of sustainability-related policies” are low, while “purchasing eco-labeled product” is recognized to be generalized but lacks in practical behavior in Japan. The result indicates a need for giving consumers PR for its correct recognition as well as constant promotion for positive outcome to raise consumers’ efficacy which has been known to lead actual behavioral changes.

The results of the regression analysis are as follows. First, both Korean and Japanese consumers performed sustainable consumption behaviors, generally based on socially shared connotations, in spite of several differences in the effects of variables on each sustainable consumption behavior. This result supports the findings by Rettie et al. (2011) [69] that consumers assess green behaviors in the context of what they understand to be normal, everyday, and mainstream. In addition, since Korea and Japan are nations with a high level of group norm and collective tendency on a cultural basis, heuristic processing is overwhelmingly based on the perceived descriptive norms even in highly involved consumption situations [70,71]. Second, the effects of “pro-environmental self-identity” was more noticeable in Japan, while Koreans were more likely to perform sustainable behaviors based on their awareness. This can be interpreted as the Japanese being more likely to consider others’ behavior, since self-identity is shaped by social backgrounds and relationships [72]. In this context, policies to increase overall social norms and perceived normalization will be far more effective in Japan, while providing objective information will be effective in Korea, to promote sustainable consumption. Third, attitude was not found to have a significant effect on the practical behaviors in Korea. Its effect also did not appear to be distinctive in Japan, except for the behaviors of purchasing eco-labeled products and recognition of sustainability-related policies, which were weakly influenced by consumers’ attitude. That is, even if consumers have favorable attitudes toward sustainability-related activities, this does not always directly translate into actual behavior, due to the significant effects of other variables. Lastly, we found that there were also significant effects of demographic variables. Generally, female and elderly consumers were found to be the major actors of sustainable consumption both in Korea and Japan; with more pronounced differences depending on consumers’ age in Korea, and gender in Japan. The results demonstrate that the segmentation by demographic characteristics and targeting for younger consumers as well as male consumers will be needed to promote sustainable consumption. However, in the case of consumer citizenship, only males showed remarkable participation. This suggests that such civil behaviors can be regarded as political actions or social movements, resulting in a high level of participation. Many scholars have accepted consumerism as a meaningful form of political engagement, and pointing out the compatibility between consumerism and other types of participation, consumer citizenship is seen as “one in a toolkit of political actions” and an expansion of the participatory repertoire by many consumers [73–75].

7. Discussion and Implications

As many researchers in the field of consumption have argued that consumer’s environmental friendly behavior reflects the success or failure of recognizing the role of institutions and routines in shaping the processes of consumption [76]. In this context, the activity areas of “consumer citizenship”, “recognition of sustainability-related policies” and “purchasing eco-labeled products” which lack in practical behavior in Japan show the needs for enhancing social infrastructure as well as the promotion of strategies. According to our analysis, although consumers tend to adopt sustainable behavior on

the basis of descriptive norms—with respect to the perception about the normalized prevalence of said behavior—these three areas which lack in actual practice are also greatly affected by descriptive norms and pro-environmental self-identity. Given that identity is shaped by social backgrounds and relationships, it can be interpreted that Japanese consumers do things by observing others and copying, and behave in a certain way when they feel other people generally do and approve of their behaviors perceiving social pressures. Therefore, we suggest information giving strategies with descriptive norm intervention such as “Your community’s Popular Choice” [77] to promote sustainability of Japanese consumers. In particular, as behavioral areas of consumer citizenship—as well as recognition of sustainable policies—are not perceived as socially normalized in Japanese society, the strategic efforts—such as giving information about “what most others do” or “what is done”—should be focus on these realms.

In addition, the impact of pro-environmental self-identity on sustainability-related activities of Japanese consumers also needs to be carefully considered. Compared to Koreans, pro-environmental self-identity greatly influence Japanese consumers’ sustainability, particularly for the activities regarding “purchasing eco-labeled products” and “use of environment-friendly packaging”. In particular, given that Japan is responsible for the largest amount of plastic packaging waste per capita after the US, strategies to increase consumers’ perception respect to pro-environmental self-identity are highly required. Moreover, as the Japanese government adopted a policy package in 2019 aimed at reducing plastic waste by 25 percent by 2030, it is inevitable for consumers to reduce plastic packaging and reorient to use of eco-friendly packaging, rather than relying on technology of plastic waste disposal [78]. As such, transition of consumption structure to cut the “Japanese culture of disposability” is highly required. However, our analysis shows that the degree of the Japanese pro-environmental self-identity is low despite its importance; there is room for improvement in perception to achieve policy goals. Meanwhile, since self-efficacy is known to create the basis for individual environmental behavior by being related to identity as well as attitude [79–81], we suggest to raise Japanese consumers’ self-efficacy by presenting the positive evaluation results of individual consumer’s behavior. In addition, since we have shown that Japanese consumers have relatively positive recognition of descriptive norms for “purchasing eco-labeled product” but lack in practical behavior, the discrepancy between descriptive norms and practical behavior will be reduced by enhancing efficacy.

Koreans are also greatly affected by perceptions of what is normal in society, so information giving strategies with descriptive norm intervention will also be effective. Meanwhile, Korean consumers tend to perform sustainable behaviors based on their awareness, except for the behavioral areas of purchasing eco-labeled products, and use of environmentally friendly packaging, which are mostly performed based on the perception of descriptive norms and self-identity. In particular, the impact of awareness is noticeable for Korean consumers’ behaviors related to having eco-driving habits. Given that Korea’s air quality is the worst among OECD due to fine particulate matter which are produced by high emissions of gasoline and diesel vehicles, promoting and spreading individual’s eco-driving practices are tasks with the biggest risk in Korea, as automobile pollution has been seriously threatening sustainability. In turn, the Korean government passed a set of bills that designate the problem a “social disaster” as a battle against air pollution in March 2019 [82]—this unlocks emergency funds to be used to tackle the issues. In this situation, our results indicate that information provision to raise consumer’s awareness toward eco-driving can encourage practical sustainable behavior to some extent. Since activities of information provision such as educational campaigns are known to be far more effective when they are targeted towards specific audiences [83], young and male consumers who are less likely to be active in environmentally friendly consumption should be the focus.

Lastly, we emphasize the need to enhance sustainability-related behaviors of consumer citizenship, since the role of consumer as citizens and their expression in civic action have rarely been studied in the domains of consumer behaviors. The result of our analysis shows lacking in recognition of both descriptive norms and practical behavior regarding consumer citizenship in both Japan and

Korea; moreover, participation in activities as a consumer citizen was limited to male consumers. It demonstrates the need to encourage consumers become involved in the public decision making process, and to promote the idea that changing things locally can be empowering. By involving various consumers who are at the root of both the causes and the solutions of sustainable consumption challenges, accountability is also more likely to be achieved [83]. Therefore, policy makers should give consumers additional mechanisms to take action easily in the public sphere, and establish greater participation in the formulation of environmental policy, and at the same time engage diverse forms of campaigns to improve consumers' awareness and activities [84].

Our study suggests strategies that could be used for the activities highlighted, showing room and priority for improvement in the sustainable consumption in each country. The results of the study can be practically used in consumer education programs or policies to translate consumers' perception into actions. However our study has several limitations despite of its implications. The biggest limitation is that the design of the survey may have created a framing cognitive bias or an order effect bias by asking repeated questions about same activities to measure the levels of awareness, perceived normal, and practical behavior. Another limitation relates to the relatively small size of our samples. Even though our results were significant, further research with bigger sample sizes would increase confidence in the robustness of the results of this study.

Meanwhile, as consumers' perceived norm and behavior will change over time, there is a need to similarly conduct a repeat of the study over time. There are also opportunities to conduct the study in additional countries, such as China, where consumers have a great potential in sustainable consumption. In turn, this will help the expansion of sustainable consumption in other subregions.

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