The Determinants of Environmental Behavior and Concern in Sweden and Japan

Introduction

Environmental problems are nothing new. By the 17th century, the importance of protecting the environment was already discussed by many knowledgeable people and governmental officers (Dauvergne, 2009). As industrialization spread and population increased, both public and private sectors began to consider environmental degradation and natural resources, becoming aware of undesirable results which industrial progress brought to society (Dauvergne, 2009). Recently, the environmental movement is becoming global and internationally recognized. In 2015, for example, the Paris Agreement gained a consensus on enhancing effort to reach nationally determined contribution by decreasing greenhouse gas emission in order to tackle the uncertainty of global climate change (United Nations, 2018).

When it comes to addressing environmental problems, Sweden is frequently mentioned as having a good reputation as an environmentally advanced country. Environmental Performance Index, which allows environmental policy to be quantitatively evaluated in terms of environmental health and ecosystem vitality, and to visualize the performance of each country, shows Sweden's prominent position (Yale Center for Environmental Law & Policy, 2018). Compared with this achievement, East Asian countries are considered to be one step behind. Even though Japan has the highest score in Asian countries, still its position is 20th, which is not as high as other OECD countries, especially compared with European countries. Based on the Environmental Performance Index, it is safe to say that there is a gap between these two countries.

From a micro-perspective, however, how people think and act are not

necessarily reflecting these results. In other words, individual environmental attitudes have room to be explored because individuals are also a driving force to face environmental problems and it is crucial for policy makers to track people's attitudes. Although a lot of studies have been done to explain them, there are few studies which closely analyzed the differences among particular countries. Sweden and Japan, for instance, are often discussed regarding environmental issue as mentioned above. However, it remains unknown whether the degree to which they are concerned about the environment and how they act environmentally is significantly different or not. Thus, this paper attempts to examine whether Sweden and Japan have a gap or not on the individual level and compare determinants of individual environmental behavior and environmental concern, particularly focusing on demographics and personal traits.

Literature review

Environmental behavior

Environmental behavior is defined in many ways. Krajhanzl (2010) suggested that all activities human beings do could be environmental behavior since they have a certain impact on the environment. On the contrary, human activities that affirmatively do something in order to improve the environment should be referred to as pro-environmental behavior (Krajhanzl, 2010). Stern (2000) also comprehensively reviewed the concept of environmentally significant behavior, clearly dividing environmental behavior into four types: environmental activism, non-activist behaviors in the public sphere, private-sphere environmentalism, and other environmentally significant behaviors. Even though prior studies defined environmental behavior and

called it in a different way, environmental behavior in general can be defined by the degree to which environmentally conscious actions by human beings has an impact on the environment.

Value orientation cannot be ignored when it comes to environmental behavior. Schultz (2000) found that altruism, egoism and biosphere were latent factors that motivated environmental behavior, which supported to develop environmental behavior studies (Schultz, 2000, 2001; Schultz & Zelezny, 1999). The Value-Belief-Norm (VBN) model by Oreg and Katz-Gerro (2006), for instance, contributed to the findings that post-materialistic values affected environmental concern, and in turn environmental behavior. Perceived threat also explained environmental concern as well as environmental behavior (Oreg & Katz-Gerro, 2006).

Regarding demographics, years of education and gender were positively correlated with environmental behavior and attitudes (Kollmuss & Agyeman, 2010). However, they noted that a longer education period did not necessarily promote environmental behavior. In addition to this, a cross-national research about gender variation in environmental behavior showed that women were more likely to act environmentally especially in private sphere in many nations (Hunter, Hatch & Johnson, 2004), which obtained similar results that Kollmuss and Agyeman (2010) showed.

Environmental knowledge is a controversial factor to explain environmental behavior. Some studies showed that environmental knowledge did not have a direct influence on environmental behavior (Kollmuss & Agyeman, 2010). A comparative study about environmental behavior, knowledge, and attitudes presented that

environmental knowledge took a role of a bridge between environmental attitude and behavior (Arbuthnot & Lingg, 1975), which might be one way to explain environmental knowledge in connection with behavior.

Environmental Concern

Environmental concern is often defined as recognition of environmental problems, including to make effort to address them (Dunlap & Jones, 2002). The definition has two dimensions. One is reasonable perception of environmental issues, and the other is willingness to take actions.

Many studies have been done since the 1970s regarding environmental concern (Marquart-Pyatt, 2012) to find out which demographic factors predict it. Franzen and Vogl (2013) examined cross-national environmental concern from 1993 to 2010, discussing that wealth explained environmental concern to a great extent. The result of determinants of environmental concern also showed that education was the most influential factor. Marquart-Pyatt (2012) also demonstrated that not only demographics such as age, gender, education and income but also environmental knowledge were explanatory predictors to environmental concern especially on the individual-level. At the country level, economic, political, and environmental factors were key determinants.

Tam and Chan (2018) examined the gap between environmental concern and environmental behavior, showing that those who were concerned about the environment were not acting accordingly because they were afraid of free riders. It should be remarked that generalized trust was strongly associated with the relationship of these

two, meaning that high trustworthiness in people narrowed the gap between the concern and behavior.

By reviewing previous studies, it can be implied that demographic factors are a focal point of both environmental behavior and concern even though environmental knowledge and education are particularly open to question. Moreover, the connection between environmental behavior and concern remains to be discussed.

Method

By employing secondary data from the International Survey Programme (ISSP) 2010, environmental concern and environmental behavior were examined.

First, a one-way ANOVA was conducted to evaluate the difference between Sweden and Japan in each case of environmental behavior and concern. Next, multiple linear regression analyses were performed to examine how the two dependent variables, environmental concern and environmental behavior, were explained by the following independent variables: age, gender, place of living, marital status, educational level, environmental knowledge, environmental organization, party affiliation, post-materialistic attitudes, trust in people, trust in government, and perceived threat.

In this study, environmental behavior was created by calculating the mean of the following seven items: 1) How often do you make a special effort to sort glass or tins or plastic or newspapers and so on for recycling?, 2) How often do you make a special effort to buy fruit and vegetables grown without pesticides or chemicals?, 3) How often do you cut back on driving a car for environmental reasons?, 4) How often do you reduce the energy or fuel you use at home for environmental reasons?, 5) How

often do you choose to save or re-use water for environmental reasons?, and 6) How often do you avoid buying certain products for environmental reasons? The Cronbach's alpha was 0.714 in the Swedish case and 0.737 in the Japanese case, suggesting that the measure was adequate.

Environmental concern was measured by computing the mean of following nine items: 1) I do what is right for the environment, even when it costs more money or takes more time, 2) How willing would you be to accept cuts in your standard of living in order to protect the environment?, 3) How willing would you be to pay much higher prices in order to protect the environment?, 4) How willing would you be to pay much higher taxes in order to protect the environment?, 5) Modern science will solve our environmental problems with little change to our way of living, 6) People worry too much about human progress harming the environment, 7) We worry too much about the future of the environment and not enough about prices and jobs, 8) It is just too difficult for someone like me to do much about the environment, and 9) In order to protect the environment the country needs economic growth (Note: Items 1, 2, 3 & 4 were reverse-scored). The Cronbach's alpha was 0.771 and 0.707 respectively each for Swedish and Japanese case, suggesting again that the measure was adequate.

Result and Discussion

One-way ANOVA

There was a statistically significant difference between Sweden and Japan as determined by a one-way ANOVA ($F(1, 2486) = 85.176\ p = .000$) in the case of environmental behavior. The results of the ANOVA also indicated there was no

significant difference in environmental concern between the two nations ($F(1, 2018) = 2.436$, $p = .119$). Thus, results suggested that in terms of environmental behavior, Japanese people (M=2.4572, SD=.59121) were likely to act in a more environmentally-friendly way compared to Swedish people (M=2.2451, SD=.55043). On the other hand, environmental concern was not significantly different (See Tables 1 and 2).

This result is intriguing because Sweden, as a country, performs better than Japan on the Environmental Performance Index 2018 (Yale Center for Environmental Law & Policy, 2018). Therefore, it is possible that there is no clear relationship between a country's performance and individual efforts, at least in the Swedish and Japanese case.

Table 1. Result of one-way ANOVA analysis of environmental behavior between Sweden and Japan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27.889	1	27.889	85.176	.000
Within Groups	813.996	2486	.327		
Total	841.886	2487			

Table 2. Result of one-way ANOVA analysis of environmental concern between Sweden and Japan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.820	1	.820	2.436	.119
Within Groups	679.267	2018	.337		
Total	680.087	2019			

Demographic characteristics

Age had positive influences on both environmental behavior and concern in Sweden and Japan except for environmental concern in the Swedish case (see Table 3).

This means that the older people are, the more they are likely to concern about the environment and act environmentally.

Table 3 indicated that females were more likely to have environmentally friendly attitudes. Previous studies showed the same tendencies (Hunter, Hatch, & Johnson, 2004; Kollmuss & Agyeman, 2010). Given the fact that environmental behavior particularly measures environmental behavior in private sphere in this study, the result is strongly supported by the findings by Hunter et al. (2004).

When it comes to place of living, it was not significant. Table 3 implies that living in city or countryside does not have a connection with environmental behavior and concern.

Marital status was significant only in environmental behavior in Sweden. This result means that married persons are less likely to do environmental actions. However, Japanese samples do not have married status section, which makes comparison infeasible.

As Table 3 suggested, education did not predict environmental behavior even though higher secondary and university degree had a positive influence on environmental concern in Japan. In terms of environmental behavior, the result is against the findings from international surveys (Franzen & Vogl, 2012, 2013; Marquart-Pyatt, 2012). However, as it is mentioned in literature review, education is not a stable predictor. Overall, education did not affect environmental behavior in the Swedish and Japanese cases.

Personal traits

As some prior studies found that even though environmental knowledge was not a directly predicting environmental behavior (Arbuthnot & Lingg, 1975; Marquart-Pyatt, 2012; Kollmuss & Agyeman, 2010), Table 3 suggested that environmental knowledge was an explanatory variable to environmental behavior and concern. However, it should be examined by specifically paying attention to the relationship among those environmental knowledge, behavior and concern, considering the controversial discussion about how environmental knowledge affects these dependent variables.

Environmental organization was not significant. Table 3 suggested that belonging to environmental organization did not necessarily lead people to think about the environment and behave in an environmentally-friendly way.

Party affiliation was the one which showed different effect in environmental behavior in each country. In Sweden, those who supported left, center left, center and liberal party did not tend to make effort to the environment whereas Japanese who had these preferences were more likely to act environmentally. According to Franzen and Vogl (2013), right party supporters had higher interest in economy and business over environmental issues. However, this result pointed out that those who support left party did not necessarily prioritize environmental issues.

Post-materialistic attitudes were not significant in both cases in Sweden and Japan. Although Oreg and Katz-Gerro (2006) found positive connection with post materialism, environmental concern and behavior, their studies took many countries into account, including developing countries. Moreover, this result was also against

Inglehart's post materialism hypothesis (1997). An explanation why post materialistic attitudes did not predict the dependent variables is that this study only compared only two developed nations.

Trust in people and trust in government did not affect environmental behavior in both countries. However, environmental concern was explained by trust in people in both cases. Even though Schultz (2000) referred that altruism motivated environmental behavior, Table 3 showed that it was influential only on environmental concern. This implies that not only altruism, but also egoism and biosphere should be taken into account in order to predict environmental behavior.

In both dependent variables, perceived threat showed significant effect. In other words, people who recognized environmental threat were likely to concern about the environment and made effort to do something as the Value-Belief-Norm (VBN) suggested that perceived threat affected positively environmental behavior (Oreg & Katz-Gerro, 2006). Also Table 3 indicated that perceived threat had an influence on environmental concern as well.

Table 3. Determinants of environmental behavior and concern

	Environmental Behavior		**Environmental Concern**	
	Sweden	Japan	Sweden	Japan
Demographic vairables				
Age	.008**	.012*	-.001	.002
	(.000)	(.000)	(.470)	(.009)
Male	-.153***	-.083*	-.143***	-.093***
	(.000)	(.005)	(.000)	(.000)
Countryside	-.013	.063	-.017	-.024
	(.675)	(.057)	(.565)	(.421)
Married	-.082**		-.024	
	(.009)		(.440)	
Intermediate secondary	.060		.023	
	(.169)		(.601)	
Higher secondary	.052	-.011	.009	.103**
	(.322)	(.779)	(.857)	(.004)
University degree	.020	.033	.004	.222***
	(.660)	(.431)	(.926)	(.000)
Personal traits				
Environmental knowledge	.136***	.135**	.095***	.086***
	(.000)	(.000)	(.000)	(.000)
Environmental organization	-.003		.024	
	(.926)		(.463)	
Party affiliation (left)	-.103*	.087*	-.032	.004
	(.014)	(.016)	(.443)	(.910)
Postmaterialisitc attitudes	.024	.016	.062***	.011
	(.119)	(.315)	(.000)	(.466)
Trust in people	.028	-.018	.070***	.069***
	(.075)	(.324)	(.000)	(.000)
Trust in government	.026	-.001	.061**	.023
	(.192)	(.933)	(.002)	(.140)
Perceived threat	.144***	.107**	.166***	.098***
	(.000)	(.000)	(.000)	(.000)
Constant	.824***	1.07**	1.886***	2.080***
	(.000)	(.000)	(.000)	(.000)
R square	.198	.222	.202	.120
Number of samples	1181	1307	1181	1307

* p < .05. **p < .01. ***p < .001

*Japanese samples did not have data of marital status, intermediate secondary, and environmental organization.

Conclusion

Overall, this paper aimed to reveal and compare determinants of environmental behavior and concern in Sweden and Japan at the individual-level. The results found that there was no significant difference between Sweden and Japan in terms of environmental concern while environmental behavior was significantly different. Unlike the country-level performance (Yale Center for Environmental Law & Policy, 2018), this paper revealed Japanese people were more likely to act environmentally than Swedish people. Moreover, multiple regression analyses suggested that females, those with more environmental knowledge, and those who perceived environmental threat were strong predictors in both nations. Paradoxically, however, education was not significant except for the case of environmental concern in Japan. Thus, the relationship between environmental knowledge and education remain to be examined in future research. Although party affiliation (left) predicted the dependent variables negatively in Sweden and positively in Japan, it has room to be explored more by taking specific party preferences into account. The results and analyses clearly indicate that it is crucial for individuals and policy makers in Sweden and Japan to place an importance on environmental knowledge to promote individual environmental behavior. Hence, future work should explore the effects of environmental knowledge in relation to education and the connection between environmental behavior and concern also should be analyzed.

References

Arbuthnot, J., & Lingg, S. (1975). A Comparison French and American environmental behaviors, knowledge, and attitudes. *International Journal of Psychology,* 10 (4), 275-281.

Dauvergne, P. (2009). *HIstorical Dictionary of Environmentalism*. Maryland: The Scarecro Press Inc.

Dunlap, R.E., & Jones, R.E. (2002). Environmental concern: Conceptual and measurement issues. In R.E. Dunlap & W. Michelson (Eds.), *The Handbook of Environmental Sociology* (Pp. 482-524). Westport, CT: Greenwood Press.

Franzen, A., & Vogl , D. (2013). Two decades of measuring environmental attitudes: A comparative analysis of 33 countries. *Global Environmental Change*, 23, 1001-1008.

Hunter, L., Hatch, A., & Johnson, A. (2004). Cross-National Gender Variation in Environmental Behaviors. *Social Science Quarterly,* 85 (3), 678-694

ISSP Research Group. (2012) I*nternational Social Survey Programme: Environment III - ISSP 2010* [Data file and code book]. Retrieved October 17, 2018, from https://dbk.gesis.org/dbksearch/download.asp?db=E&id=47651

Inglehart, R. (1997). *Modernization and Postmodernization: Cultural, Economic and Political Change in 43 Societies*. Princeton, NJ: Princeton University Press.

Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act

environmentally and what are the barriers to pro-environmental behavior?. *Environmental Education Research*, 8 (3). 239-260.

Krajhanzl, J. (2010). Environmental and proenvironmental behavior. *School and Health*, 21.

Marquart-Pyatt, S. (2012). Contextual influences on environmental concerns cross-nationally: A multilevel investigation. *Social Science Research*, 41 (5), 1085-1099.

Oreg, S., & Katz-Gerro, T. (2006). Prediction Proenvironmental Behavior Cross-Nationally Values, the Theory of Planned Behavior, and Value-Belief-Norm Theory. *Environment and Behavior*. 38 (4), 462-483.

Schultz , P. (2000). Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues. *Journal of Social Issues*, 56 (3), 391–406.

Schultz, P., & Zelezny, L. (1998). Values and Proenvironmental Behavior: A Five-Country Survey. *Journal of Cross-Cultural Psychology*, 29 (4), 540-558.

Schultz, P. (2001). The Structure of Environmental Concern: Concern for Self, Other People, and The Biosphere. *Journal of Environmental Psychology*, 21 (4), 327-339.

Stern, P. S. (2000). Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues*, 56 (3), 407-424.

Tam, K. P., & Chan, H.W. (2018). Generalized trust narrows the gap between environmental concern and pro- environmental behavior: Multilevel evidence.

Global Environmental Change, 48, 194

United Nations. (n.d.). *The Paris Agreement*. Retrieved December 22, 2018, from https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Yale Center for Environmental Law & Policy. (2018). 2*018 Environmental Performance Index.* Retrieved December 22, 2018, from https://epi.envirocenter.yale.edu/downloads/epi2018policymakerssummaryv01.pdf