

How Are Mass Media Exposure and View of Nature Relevant to Environmental Attitude and Behavior?: Examining the Process of Media Influence with Audience Perspective

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Introduction

Environmental issues are important agendas in the modern society. Human activities have caused various environmental problems, and recently global environmental issues have become more serious. Most of the consequences of global environmental issues, such as climate change or global warming, are not observable. Therefore, mass media plays an important role in the construction of environmental issues and problems (Boykoff & Boykoff, 2004). The survey conducted by National Institute of Environmental Studies (2016) revealed that 39.6 percent of Japanese respondents believed journalists and critics in mass media to be the most reliable sources for knowledge about environmental issues. Despite recent transformation of media environment, it seems that mass media is still one of the main sources for getting information about environmental issues in Japan.

Mass communication studies have provided evidence that mass media shapes public opinion through framing (e.g., Scheufele, 1999). According to Gamson and Modigliani (1989), media frame is a central organizing idea or a story line of news. Media frame determines the essence of the issue and suggests what the controversy is about. That means: to frame is to select some aspects of a perceived reality and make them more salient in a communicating context, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or a treatment recommendation (Entman, 1993).

Regarding global environmental issues, several studies have been carried out to examine how Japanese mass media covered those problems. For example, Nagai (2015) reported media frames in Japanese newspapers on global warming emphasized more on politics than science. Kawabata (2017) analyzed newspaper coverage on COP21, Conferences of the Parties under the United Nations Framework Convention on Climate Change (UNFCCC), and found out the media frames they used were mainly “conflict” and “coexistence.” It shows that those

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coverages emphasized only on diplomatic bargaining in the conference, rather than scientific facts or consequences of global warming. Kawabata (2016) also analyzed the TV news coverage about COP21. It was less frequently reported than in newspapers during the period of the conference, and the “conflict” frame was dominantly highlighted in those TV news programs. These results raise questions how this kind of mass media contents would shape the Japanese public opinions or attitudes regarding global environmental issues.

In addition to the media frame, there is another process for audience to interpret messages from media. Media frame is the interpreted selection from mass media; however, on the other hand, there is the audience frame, which is a version of reality built from personal experience and interaction with peers (Scheufele, 1999). Neuman et al. (1992) pointed out that media and audience may apply different frames to interpret the same issue. For example, they discovered that news about social issues tend to emphasize more on the “conflict” or “powerlessness” frame; however, audience interpret those news more with “human impact” or “morality” frames. That is, when audience is exposed to media coverage, how they interpret news may be also affected by their value, interest, or way of thinking.

Japanese View of Nature

Because the audience frame about environmental issues is built from personal experience of the audience, it may be also influenced by their view of nature. Watsuji (1935) explained that the monsoonal climate made Japanese people receptive to the blessing from nature and patient towards natural disasters. Also, he said that Japanese respect symbiosis with nature. Symbiosis means mutually beneficial relationship of two groups, so it may encourage people to have empathy for nature. A study by Tam (2013) has shown that empathy for nature is associated with environmentally friendly attitudes. Therefore, it can be stated that empathy for nature may affect the audience frame for environmental issues.

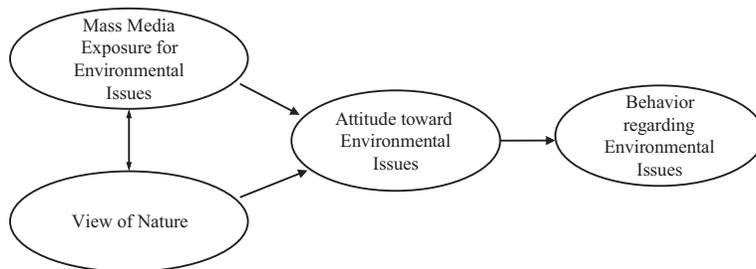
According to Maebayashi (2016), Japanese people have experienced numerous natural disasters throughout their history, so they have an impermanent view of nature. In 2011, the Great East Japan Earthquake struck, causing tsunamis, which resulted in damaging nuclear power plants. During the last decade, Japan not only faced massive earthquakes, but also a number of typhoons, landslides, and other disasters; images of disaster in the country were repeatedly displayed by TV news programs. Such reporting may urge the audience to think that nature is impermanent and feel less self-efficacy about it.

From survey research, Hayashi (1999) mentioned Japanese view of nature with the results of the national survey from 1953 to 1998. According to Hayashi (1999), the opinion about nature, whether it is to be conquered or obeyed for human happiness, had changed from being conquered to being obeyed, especially after

1968, when pollution was widely recognized as a serious problem in Japan. From 1976 to 1993, she said that the percentage of respondents who had spiritual ways of thinking about nature increased, and those people were of the view that nature should not be modified by humans.

If the way of thinking about nature affects how audience interprets media messages about environmental issues, their view regarding nature can be considered as a base of audience frame. Based on this premise and existing research results, mass media information about environmental issues, audience's view of nature, the audience attitude, and behavior about environmental issues can be structured as in the following model (see Figure 1). The model shows that mass media exposure for environmental issues and view of nature interact with each other. The view of nature is constructed through personal experiences and information from mass media. Additionally, audience's view of nature may affect audience frame, which the audience uses to interpret media messages. Both mass media exposure and view of nature influence the audience's attitude towards environmental issues. Consequently, the attitude influences their behavior regarding environmental issues.

Figure 1. Research model of the current study



The Purpose

A number of researches have been carried out to determine how media messages influence audience's attitude, including research on media frame. When the audience receive news or information from mass media about environmental issues, view of nature can be the base of the audience frame. In this study, the research model in Figure 1 was proposed by considering the role of audience frame—in this case as their view of nature—with respect to the process of mass media influence regarding environmental issues. The purpose of this study was to examine this model with respect to environmental issues, and to consider the process of mass media influence.

The Method

In this study, to investigate the purpose, an online survey was conducted to determine the view of nature of Japanese people, mass media exposure for environmental issues, and their environmental attitude and behavior. The survey was conducted by a research company (Macromille, Inc.) in February 2019. The survey sample was drawn from a pool of monitors, allocated by sex, and the age ratio of the population in the 8 divided areas covered the whole country. The age of the respondents was from 15 to 79, and the number of respondents was 3,156. The survey items asked in the questionnaire were view of nature, attitudes and behaviors towards environmental issues, environmental communication, and demographic information.

To measure the view of nature, a 4-item empathy for nature scale ($\alpha=.80$) was used in the questionnaire. To determine the view of forests, which measures how mysterious they think of forests, a 4-item scale ($\alpha=.79$) was included. The scales have been used in the nation-wide survey on Japanese national character by the institute of Statistical Mathematics since 1953 (Hayashi, 1999). A disaster scale, which was applied from Horibata (1993), was also included to measure the view of nature. The scale consisted of two statements, which were, "I think disaster is the revenge from nature" and "I think heaven causes disasters to discipline humans."

Additional scales were included to measure attitudes toward environmental issues (5 item-scale which includes items such as "I will gladly agree with the policy to raise tax for controlling greenhouse gas emissions", $\alpha=.73$), personal norms for environmental issues (3 item-scale, which includes statements such as "I am proud to behave in an environmentally friendly manner", $\alpha=.72$), and a sense of crisis about environmental issues (2 item-scale, $\alpha=.66$). Moreover, behavior regarding environmental issues (6 item-scale which asks if they take actions such as buying products with the Eco mark, $\alpha=.74$) was also measured. All the scales were answered agree or disagree by 5-point scale.

The environmental communication measures used in the analysis were: if the audience use mass media as a main source of information for environmental issues and consciousness towards the environmental issues in mass media. The demographic items used for analysis were sex and age.

The Result

Information Source for Environmental Issues

First, Table 1 shows the top five sources from where respondents get information about environmental issues. There were 83.8% of respondents who said they get information about environmental issues from TV news programs, and 56.6% said from TV programs other than news. The third ranked source was

newspaper (46.0%) and only 24.3% answered they get it from Social networking service. The result shows mass media still plays a very important role in informing the Japanese public about environmental issues.

Table 1. Top five sources for getting information about environmental issues

Source*	N (%)
TV News programs	2644 (83.8)
TV programs (other than News)	1785 (56.6)
Newspaper	1453 (46.0)
Friends and family	1110 (35.2)
Social Networking Service	768 (24.3)

N=3156.

* multiple answered questions

Correlations Between the Variables

Among the demographic variables, sex and age had significant correlations with most of the environmental attitude and behavior variables. For example, female respondents had more empathy for nature ($r=.13, p<.001$), more strong sense of crisis about environmental issues ($r=.16, p<.001$), and had more environment-friendly behavior ($r=.25, p<.001$). Similarly, older respondents had more empathy for nature ($r=.23, p<.001$), had more strong sense of crisis about environmental issues ($r=.14, p<.001$), and had environment-friendly behavior ($r=.27, p<.001$). In order to eliminate the effects of sex and age, the Pearson's correlations between view of nature, environmental attitude, mass media exposure were analyzed while controlling sex and age (Table 2).

Table 2. Partial correlation coefficients between view of nature, environmental attitudes and mass media exposure controlling with sex and age

variables	Correlation Matrix							
	1	2	3	4	5	6	7	8
1. empathy scale	-							
2. view of forest scale	.59***	-						
3. disaster scale	.46***	.38***	-					
4. attitude scale	.48***	.38***	.28***	-				
5. sense of crisis	.39***	.31***	.18***	.31***	-			
6. personal norms	.54***	.41***	.25***	.44***	.52***	-		
7. mass media as main source for environmental issues	.13***	.15***	.07***	.16***	.12***	.16***	-	
8. consciousness for the environmental issues in mass media	.37***	.27***	.15***	.38***	.26***	.36***	.19***	-

N=3156.

*** $p < .001$

Table 2 shows Pearson's partial correlation coefficients between view of nature, environmental attitudes, and mass media exposure while controlling sex and age. All relationships were significantly positive ($r = .07 \sim .59$, $p < .001$), and all the correlations between variables of view of nature and media exposure were also positive ($r = .07 \sim .37$). As a variable of media exposure, consciousness towards environmental issues in mass media had stronger correlation with view of nature ($r = .15 \sim .38$, $p < .001$) than mass media as the main source for environmental issues ($r = .07 \sim .16$, $p < .001$). The result showed that mass media exposure for environmental issues and view of nature correlated and may interact with each other, as shown in the model of Figure 1.

Regression Analyses

Table 3 showed the results of multiple regression analyses to examine if factors relating to mass media exposure and view of nature predicted attitudes towards environmental issues. The result showed that when attitude toward environmental issues was the dependent variable, all the mass media exposure and view of nature variables had significant impact as independent variables ($\beta = .05 \sim .30$, $p < .01$).

Table 3. Multiple regression analysis for attitude toward environmental issues

Independent variables	Attitude toward environmental issues scale	Personal norm about environmental issues scale	Sense of crisis about environmental issues scale
	β	β	β
Mass media exposure			
Mass media is the main source for environmental issues	.06***	.06***	.04*
Consciousness for the environmental issues in mass media	.23***	.17***	.12***
View of nature			
Empathy for nature scale	.30***	.40***	.29***
View of forest scale	.11***	.12***	.11***
Disaster scale	.05**	-.01	-.01
Sex (male=1, female=2)	.04*	.10***	.11***
Age	.02	.03*	.01
R^2	.33	.38	.21
Adjusted R^2	.33	.38	.21
N	3156	3156	3156

* $p < .05$, ** $p < .01$, *** $p < .001$

When personal norm about environmental issues was the dependent variable, all of mass media exposure variables and demographic variables had significant impact on the personal norm scale. And as view of nature variables, the empathy for nature scale and view of forest scale had significant impact on the attitude, but the disaster scale did not significantly contribute. Mass media exposure variables, empathy for nature scale and view of forest scale, and sex had impact on sense of crisis about environmental issues. For the dependent variables of personal norm and sense of crisis for environmental issues, females predicted higher scores on the scales than males. Only the personal norm for environmental issues was predicted by age, though the coefficient was weak.

To examine the research model, multiple regression analyses were conducted to clarify the impact of attitudes and behaviors towards environmental issues. Table 4 shows the result of multiple regression analyses for behavior regarding environmental issues. According to the result, attitudes toward environmental issues, personal norms for environmental issues, sense of crisis for environmental issue, as well as sex and age, all significantly predicted behavior regarding environmental issues. Among the independent variables, the impact of attitudes toward environmental issues and personal norm for the environmental issues were stronger than other variables. This result was compatible with the model in Figure 1.

Table 4. Multiple regression analysis for behavior regarding environmental issues

Independent variables	Behavior regarding environmental issues scale
	β
Attitude toward environmental issues	
Attitude toward environmental issues scale	.22***
Personal norm for environmental issues scale	.25***
Sense of crisis for environmental issues	.11***
Sex (male=1, female=2)	.17***
Age	.15***
R^2	.35
Adjusted R^2	.34
N	3156

*** $p < .001$

Discussion

The current study tried to figure out how mass media exposure for environmental issues and Japanese view of nature matter to their environmental attitudes and behaviors. A research model was proposed and examined with an online survey data of 3,156 respondents. The model of this study was that mass media exposure for environmental issues and the view of nature of the audience interact to influence attitudes toward environmental issues, and the attitude influences behaviors towards environmental issues.

Demographic variables, especially sex and age, were associated with various other variables used in this study. Therefore, in each analysis, those two variables were included. To examine the interaction between mass media exposure for environmental issues and view of nature, Pearson's partial correlations, controlling sex and age, were analyzed. The result showed positive correlations between all the variables of mass media exposure for environmental issues and view of nature. It showed that mass media influence and view of nature positively interacted with each other.

As a result of multiple regression analyses for attitudes toward environmental issues, mass media exposures for the environmental issues and view of nature scales had positive impacts on the attitudes. The result indicates the importance of empathy for nature, spiritual thoughts about nature, mass media exposure, and consciousness regarding environmental issues, to promote pro-environmental attitude. Disaster scale did not have significant impacts on personal norm or sense of crisis about environmental issues. The higher the score on the disaster scale, the more the

respondents think disaster is a revenge or an act to discipline humans from nature. Those people who have higher score on the disaster scale have less efficacy to deal with disaster; therefore, this kind of view of nature may not have an impact on attitudes toward environmental issues. In the same analysis, sex and age also had impact on attitudes toward environmental issues. Sex showed positive impacts on all the attitude scales, and it meant females had higher scores on those scales. Age had a weak positive impact on personal norm regarding environmental issues; that meant older people have stronger personal norms about environmental issues than younger people.

Finally, for the impact of attitude on behavior towards environmental issues, the result of the regression analysis showed positive impacts of all three scales of attitudes toward environmental issues as well as sex and age. This result was interpreted that attitude toward environmental issues influenced behavior towards environmental issues. With all the above results, the research model shown in Figure 1 was proved.

In this study, it was suggested that mass media is still one of the main sources for getting information about environmental issues and has influence on the attitudes toward environmental issues. It was also found out that the view of nature affects attitudes toward environmental issues, interacting with mass media exposure of environmental issues. This result indicated the importance of audience frame in the process of media influence and added some insights into future research on media frame and media influence. To solve global environmental issues, mass media may apply more audience-oriented frames to communicate environmental issues. It may make the audience understand the news or information better, and it will lead to solution of the environmental problems.

Note

The original version of this paper, titled as “Japanese view of nature and environmental communication”, was presented at the Environment, Science and Risk Communication Working Group at International Association for Media and Communication Research (IAMCR) Conference in Madrid, July 10, 2019.

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