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Structural Relationships among Environmental Engagement, Sustainable Behavior, and Happiness in University Students

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Abstract

The purpose of the study is to investigate the relationships among environmental engagement, sustainable behavior, and happiness. The study used structural equation modeling. It is to examine the relationship among these variables. We tested two structural equation models compared. The results revealed that the present data best fit Model 1. Environmental engagement has direct and indirect effects on happiness and is mediated by sustainable behavior (χ^2 (74) =151.094, TLI=.931 CFI=.944 RMSEA=.06). The results indicate that environmental engagement affects happiness. Also, environmental engagement affects happiness indirectly through the mediation of sustainable behavior. In closing, implications for environment education are discussed.

Key words: Environmental, Engagement, Sustainable, Behavior, Happiness.

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Relaciones estructurales entre compromiso ambiental, comportamiento sostenible y felicidad en estudiantes universitarios

Resumen

El propósito del estudio es investigar las relaciones entre compromiso ambiental, comportamiento sostenible y felicidad. El estudio utilizó modelos de ecuaciones estructurales. Es examinar la relación entre estas variables. Probamos dos modelos de ecuaciones estructurales comparados. Los resultados revelaron que los datos actuales se ajustan mejor al Modelo 1. El compromiso ambiental tiene efectos directos e indirectos en la felicidad y está mediado por un comportamiento sostenible (χ^2 (74) = 151.094, TLI = .931 CFI = .944 RMSEA = .06). Los resultados indican que el compromiso ambiental afecta a la felicidad. Además, el compromiso ambiental afecta la felicidad indirectamente a través de la mediación del comportamiento sostenible. Para terminar, se discuten las implicaciones para la educación ambiental.

Palabras clave: Medioambiente, Compromiso, Sostenibilidad, Comportamiento, Felicidad.

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1. INTRODUCTION

Air pollution and other environmental problems have emerged as serious global issues. In particular, in Asia, increasing environmental pollution caused by particulate matter is creating difficulties in people's lives. These environmental issues require more attention as a global concern because they result in psychological as well as socioeconomic problems Choi (2016) and they affect future

generations because we share this planet with them. Human behavior may cause unforeseen environmental problems such as air and water pollution and climate change, and solving these problems requires understanding individuals' attitudes toward and engagement with the environment. To maximize change-specific behaviors, it is necessary to understand the network of attitudes that are embedded. Environmental psychologists have studied complex interactions between humans and their environments.

Engagement is the opposite of burnout: It is a positive and enthusiastic state of mind, and it is increasingly popular in global environmental assessment. Environmental engagement refers to greater involvement in and commitment to environmental protection and engagement includes the importance of, concern for, and awareness of the environment. In one recent study, those who perceived themselves as environmentally friendly practiced environmental protection more; this includes, for example, generating less garbage, eco-shopping, and saving water and other resources. However, there is a question of what makes people practice environmentally friendly behavior. External factors include social and cultural factors; internal factors include motivation, environmental knowledge, environmental awareness, values, attitudes, emotions, and sense of responsibility. A person who engages with the environment perceives himself or herself as an environmentalist or an eco-citizen; as a result, he or she protects the environment. Practicing pro-environmental behavior requires a strong sense of responsibility because the behavior is driven by environmental concern and awareness. Authors of another study reported that people

are more environmentally friendly if they have knowledge and awareness of environmental issues. Conversely, lack of knowledge and awareness of the environment can reduce the effectiveness of environmental action. These findings demonstrate that engagement has the power to promote individual environmental protection behavior. How individuals perceive the environment creates an environmental identity, which is an important predictor of ecofriendly behavior (Tapia-Fonllem et al., 2013).

Pro-Environmental behavior is instrumental in building sustainable societies, and such societies also require altruism and the attitude of fairly sharing finite resources. The behavioral combination of environmental friendliness, altruism, and fairness is called sustainable behavior; sustainable behavior refers to behaviors to conserve the planet's finite resources. People make efforts to keep the planet clean and protect fauna and flora and humans for sustainable societies; this is related to both global and individual well-being. It is also presumably related to the well-being of future generations since we should share a clean planet with them. In other words, sustainable behavior means effective environmental protection for current and future generations and protecting the well-being of societies, cultures, and people as well as natural resources; for this reason, the sustainable behavior is a requirement for a sustainable society.

Research on happiness has shown that individuals' happiness is influenced by their attitudes; for example, people are reportedly happier when they have positive attitudes, are engaged, and have hope

for life. Engagement in a cause generates strong motivation for participation and behavior, which in turn increases psychological well-being. Sustainable behavior is also associated with individual happiness. Individuals who engage in environmentally friendly behaviors experience high levels of life satisfaction, happiness, and well-being. Fairness is associated with individual happiness as well; perceived fairness was found to increase subjective well-being. In addition, people with a fair attitude regardless of gender, age, or race experience more happiness. Altruism is also related to individual happiness; Post Corral-Verdugo et al. (2010) reported that altruistic individuals are healthier and happier mentally and physically, and happy people have cooperative and altruistic characters. Authors of another study also reported that altruism was associated with individual happiness. The findings suggest that environmental engagement is associated with individuals' sustainable behavior and that behavior and attitudes are ultimately associated with happiness (Schmuck & Schultz, 2002).

With the growing importance and urgency of environmental protection, researchers have increasingly studied individuals' environmental attitudes. However, literature on interactions between humans and the environment is relatively lacking, warranting more research. In particular, there is little prior research on the paths of environmental engagement, sustainable behavior, and happiness. Therefore, the aim of this study was to examine environment engagement and its structural relationships with sustainable behavior

and happiness by using two different models on how sustainable behavior mediates environmental engagement and happiness.

1.1. Research model

The purpose of this study was to analyze the effects of environmental engagement on sustainable behavior and happiness; to this end, structural relation models on environmental engagement, sustainable behavior, and happiness were developed based on previous research. Environmental engagement and awareness promote environmentally friendly behaviors. Corral-Verdugo et al. (2011) found that sustainable behavior, including environmentally friendly behaviors, fairness, and altruism, is related to individual happiness, and environmentally friendly behaviors have positive effects on quality of life and happiness. Environmental engagement and sustainable behavior both involve environmental concerns and considerations. Attitudes toward the environment lead to active participation in environmental protection, which in turn increases the sense of happiness. For the present study, two models were tested on the effects of environmental engagement on happiness mediated by sustainable behavior: Model 1 for both direct and indirect effects and Model 2 for indirect effects only (Ojala, 2013).

2. METHOD

2.1. Subjects

The participants in this study were 265 undergraduate students who volunteered; they were recruited from metropolitan areas in South Korea. Research surveys were administered to undergraduates during the last week of the spring quarter. Of the study population, 100 participants were male (37.7%) and 165 were female (62.3%). Of those participants, 60 (22.6%) were in their first year, 110 (41.5%) in their second year, 87 (32.8%) in their third, and 8 (3%) in their fourth. The mean age was 21.6 years (Kollmuss & Agyeman, 2002).

2.2. Measures

Environmental engagement was assessed with an environmental engagement scale Crossman (2011) with sample items such as it is important to keep water clean where i live and i help clean the area of my residence. Each item is rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree). For this study, participants responded to four items representing environmental engagement. The reliability was .87. The sustainable behavior scale developed by Garard & Kowarsch (2017) was used for this study. Sub-level factors are pro-environmental behavior, altruistic behavior, and fairness. The scale consists of 12 items, although for this study only six items were used to represent

sustainable behavior. Sample items include I try to use fewer disposable products, I have offered to help someone who is in trouble, and everyone has a right to be educated, each rated on a 5-point scale (1 = never, 5 = always). The reliability is .81.

Happiness was measured with a happiness scale developed by Gousse-Lessard et al. (2013); for this study, four items representing happiness were used. Each item is rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree), and sample items include I am happy, I am satisfied with my life, and I am feeling good. The reliability is .70.

2.3. Data analysis

The aim of this study was to investigate the structural relationships among undergraduate students' environmental engagement, sustainable behavior, and happiness. First, the research model for the study was developed based on established research, and then Models 1 and 2 were compared. To evaluate the model fit of the structural equations, maximum likelihood was used. Model fit was compared using $\chi 2$ (chi-squared statistic), $\chi 2/df$ (degrees of freedom), the Tucker-Lewis index (TLI), the comparative fit index (CFI), and the root means square error of approximation (RMSEA). After the model fit was compared, the final model was selected based on its parsimony and validity. Direct and indirect effects and the path coefficients of the

final model were also examined. These analyses were conducted using Amos 18.0 (IBM) and SPSS 19.0 (Hirsh, 2010; Kim, 2017).

3. Results

3.1. Descriptive statistics and interrelations of variables

To investigate the relationships among environmental engagement, sustainable behavior, and happiness, descriptive statistics and correlation coefficients of variables were estimated. In Table 1, the descriptive statistics and correlations among variables are presented. As shown in the table, all components correlated positively with each other; environmental engagement had the highest correlation with sustainable behavior, followed by happiness. The means (and standard deviations) of the variables ranged between 15.6 (SD = 1.5) and 24.6 (SD = 2.5)

Table 1. Descriptive Statistics and Correlations among variables (N=265)

variables	Environmental engagement	Stainable behavior	Happiness
Environmental engagement	1		
Sustainable behavior	.577**	1	
Happiness	.483**	.503**	1
M	16.5	24.6	15.6
SD	2.1	2.5	1.5

** p<.01

3.2. Mediation model

To test the fit of the structural relation models, Models 1 and 2 were compared; Table 2 presents the fit indices of the models. In Model 1, the hypothesis was that environmental engagement has both direct and indirect effects on happiness mediated by sustainable behavior. The model fit test of the Model 1 yielded $\chi 2$ of 151.094 (df = 74, p 〈.001) and standardized $\chi 2$ of 2.042, and the fit indices were TLI = .931, CFI = .944, and RMSEA = 0.06. For Model 2, the hypothesis tested was that environmental engagement has an indirect effect on happiness mediated by sustainable behavior. The model fit test yielded $\chi 2$ of 159.832 (df = 75, p 〈.001), and standardized $\chi 2$ of 2.131, and the fit indices were TLI = .925, CFI = .938, and RMSEA = 0.065. All indices for Model 1 were greater than those for Model 2; regarding the path coefficients between variables for Model 1, all were statistically significant as well. The path between environmental engagement and sustainable behavior was β = 0.686, that between environmental engagement and happiness was β = 0.323, and that between sustainable behavior and happiness was β = 0.442. In Model 2, the path between environmental engagement and sustainable behavior was β = 0.71, and that between sustainable behavior and happiness was β = 0.70. The coefficients were statistically significant. Based on the results of the model comparison, Model 1 was chosen as the final model in this study (Schaufeli, 2013).

Table 2. Fit of the mediation model (N=265)

Model	χ^2	df	χ^2/df	TLI	CFI	RMSEA
Model 1	151.094***	74	2.042	.931	.944	.063
Model 2	159.832***	75	2.131	.925	.938	.065

*** p<.001

Note. TLI=Turker-Lewis index; CFI=Comparative Fit Index; GFI=Goodness of Fit Index; RMSEA=Root Mean Square Error of Approximation

Table 3 shows the results from the path model. The path coefficient for environmental engagement to sustainable behavior was 0.686, that for environmental engagement to happiness was 0.323, and that for sustainable behavior to happiness was 0.442. The composite reliability for all paths was significant at 0.01 or less.

Table 3. Results from the path model (N=265)

Variables	β	S.E.	C.R.	p
Environmental engagement -> Sustainable behavior	.686	.076	8.521	***
Sustainable behavior -> Happiness	.442	.062	3.584	***
Environmental engagement -> Happiness	.323	.053	2.911	**

** p<.01, *** p<.001

Table 4. Results from the path model (N=265)

Path		Direct Effect	Indirect Effect	Total effect
Environmental engagement	->	.686		.686***
Sustainable behavior				
Sustainable behavior	->	.442		.442***
Happiness				
Environmental engagement	->	.323	.303	.627**
Happiness				

** p<.01, *** p<.001

To verify the effects among environmental engagement, sustainable behavior, and happiness, direct effects, indirect effects, and total effects were investigated. Table 4 shows the direct and indirect effects between variables. The environmental engagement had a direct effect of 0.686 on sustainable behavior, environmental engagement had a direct effect of 0.323 on happiness, and sustainable behavior had a direct effect of 0.442 on happiness. In particular, environmental engagement had an indirect effect of 0.303 on happiness. The relationship was mediated by sustainable behavior. Environmental engagement had a total effect of 0.627 on happiness. These results of the final model showed that environmental engagement had direct and indirect effects on happiness mediated by sustainable behavior (Figure 1) (Whitmarsh & O'neill, 2010).

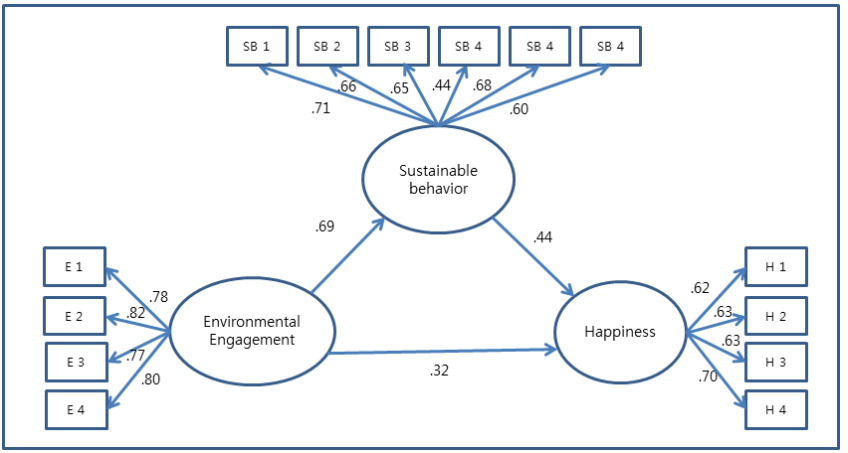

Figure1. Structural equation model regarding standardized estimates

4. DISCUSSION

The aim of this study was to determine the structural relationships among environmental engagement, sustainable behavior, and happiness. Specifically, the effects were investigated of environmental engagement on happiness mediated by sustainable behavior by comparing the two models. The assumption for Model 1 was that environmental engagement would have both direct and indirect effects mediated by sustainable behavior, whereas the Model 2 hypothesis predicted only indirect effects of environmental engagement on happiness mediated by sustainable behavior. Based on the results of the model comparison, Model 1 was selected, and the findings showed that environmental engagement had both direct and indirect effects on happiness mediated by sustainable behavior.

The study results revealed that environmental engagement and sustainable behavior predicted happiness in South Korean college students. First, students with high levels of environment engagement were found to more actively practice sustainable behavior, which was consistent with the finding of a previous study that attention and awareness in a phenomenon increases sustainable behavior. High environmental concern has been reported to lead to environmental protection behavior. These findings suggest that higher environmental concern is strongly associated with environmentally friendly behaviors, and environmental concern and sympathy with environmental causes lead individuals to more actively practice environmental protection. Environmental engagement is related to self-transcendence, and self-transcendence refers to values such as benevolence, universalism, and concern for others. Sustainable behavior also has the value of altruism.

The results of the present study also show that learners with high levels of sustainable behavior experience higher levels of happiness. This result is consistent with the reports of a positive relationship between sustainable behavior and happiness. Sustainable behavior means considering the resources that future generations to use as well as protecting current resources; therefore, sustainable behavior requires environmentally friendly, altruistic, and fair attitudes. Sustainable behavior contributes to life satisfaction and happiness as it considers the well-being of others as well as one's own.

5. CONCLUSION

Environmental engagement was also found to be positively associated with happiness. Environmental engagement involves behaviors, values, and understanding that serves environmental protection, and in previous research, this engagement is related to individuals' life satisfaction and happiness. Authors of another study proposed meaning and engagement as components of happiness. The environmental engagement was shown to be associated with indicators of both sustainable behavior and happiness in both the present research and other studies. These empirical findings suggest that individuals who are more likely to be concerned about the environment are those who are more active in sustainable behavior and who are happy. Findings may have significant implications for happiness and sustainable society. Examining the relationships among environmental engagement, sustainable behavior, and happiness helps to expand the scope of environmental psychology; it is integral to research on individuals' attitudes toward the environment. However, many other important domains remain to be explored, and follow-up research areas include the relationships between environmental engagement and other constructs such as agreeableness, self-transcendence values, prosocial orientation, and community well-being. The present study has limitations, including restrictions in study regions and participant age and the use of convenience rather than random sampling; follow-up research needs to employ various sampling methods, which will increase the generalizability of findings. It is hoped that these efforts

will contribute to the well-being of individuals and nations and help in building sustainable societies.

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