The Impact of Ecolabel on Environmental Behavior

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Abstract

The aim of this survey study is to present a model to develop environmental behavior through ecolabel. Data were collected from 146 students at Universitas Negeri Jakarta in East Jakarta in the province of DKI Jakarta. Data were analyzed by implementing the structural equation model (SEM). Result of this study confirmed a positive relationship between ecolabel and environmental behavior was not supported. Findings also stated that environmentally informative instrument, environmentally friendly label, and environmental protection were significantly positively correlated with ecolabel. Green travel was significantly positively associated with environmental behavior. However, the positive relationships between recycling and eco-products with environmental behavior were not supported in this study.

Keywords: ecolabel, environmental behavior, recycling, eco-products, green travel

Introduction

Environmental behavior includes specific behaviors consistent with recycling, buying eco-friendly and seasonal/local products, and walking/cycling for short travelling and public sphere to motivate others to be environmental volunteering (Alcock, White, Pahl, Davidson, & Fleming, 2020; Safitri, Umasih, Ibrahim, Sujarwo, Marini, Wahyudi, 2019; Safitri, Nuraini, Rihatno, Kaban, Marini, & Wahyudi, 2020; Safitri, Umasih, Yunaz, Marini, & Wahyudi, 2019; Safitri, Yunaz, Umasih, Marini, & Wahyudi, 2019; Safitri, Marini, & Wahyudi, 2020; Safitri, Budiaman, Rahmayanti, Marini, & Wahyudi, 2020). Giving opportunities for having environmental behaviors including cycling infrastructure can result in rapid adoption of sustainable habits (Kaaronen & Strelkovskii, 2020).

Exposure to nature is associated with greater pro-environmetalism (Alcock, White, Pahl, Davidson, & Fleming, 2020; Safitri, Umasih, Ibrahim, Sujarwo, Marini, Wahyudi, 2019; Safitri, Nuraini, Rihatno, Kaban, Marini, & Wahyudi, 2020; Safitri, Umasih, Yunaz, Marini, & Wahyudi, 2019; Safitri, Yunaz, Umasih, Marini, & Wahyudi, 2019; Safitri, Marini, & Wahyudi, 2020; Safitri, Budiaman, Rahmayanti, Marini, & Wahyudi, 2020). Pro-environmental habits adoption is very important to have safeguard ecosystems (Kaaronen & Strelkovskii, 2020). Human behavior patterns can strongly stimulate the quality of environment (Shafiei & Maleksaeidi, 2020). Environmental problems can be lessened by environmental behavior development (Ruepert, Keizer, Steg, Maricchiolo, Carrus, Dumitru, Mira, Stancu, & Moza, 2016; Jeswani & Azapagic, 2020; Fabi, Nicoli, Spigliantini, & Corgnati, 2017; Vilchez, 2017; Adnan, Ahmed, Shakshuki, Yasar, 2019; Lavelle, Rau, & Fahy, 2015). Environmental degradation is caused by anthropogenic activities (Mei, Wai, & Ahamad, 2016; Fransman, & Timmeren, 2017). However, most studies have not given a more detail explanation about environmental behavior indicator measurement related to recycling, eco-products, and green travel.

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According to government legislation No. 46 in 2016 about procedures for operation of strategic environmental studies, sustainable development is a consciously planned effort to integrate environmental, social, and economic aspects into development strategies in order to ensure the environment, safety, ability, welfare, and quality integrity of current and future generation lives. There is a positive relationship between ecolabel and consumer concern about environment pointing out that environmental consideration is a consumer motivation of willingness to pay eco-labeled goods (Liu, Yan, Zhou, 2017). However, most studies don't provide a more detail explanation about ecolabel indicator measurement.

Literature review
Environmental attitude improvement can protect the environment and improve the likelihood of environmental behaviors in community (Shafiei & Maleksaeidi, 2020). Environmental behaviors can be encouraged by general environmental considerations involving biospheric values and environmental self-identity (Ruepert, Keizer, Steg, Maricchiolo, Carrus, Dumitru, Mira, Stancu, & Moza, 2016; Jeswani & Azapagic, 2020; Fabi, Nicoli, Spigliantini, & Corgnati, 2017; Vilchez, 2017; Adnan, Ahmed, Shakshuki, Yasar, 2019; Lavelle, Rau, & Fahy, 2015). Public environmental awareness and behavior level are determined by social-psychological factors (Mei, Wai, & Ahamad, 2016; Fransman, & Timmeren, 2017) (Maseleno et al., 2019). However, the previous studies have not given detail environmental behavior indicator measurement related to recycling, eco-products, and green travel.

Ecolabel as a voluntary instrument indicates ecofriendly products (Struwig & Adendorff, 2018). Consumer attitude of the product impact on the environment can be developed by ecolabel. Ecolabel firmly ascertained the consumer decision making process due to consumers informed with the product knowledge of being environmentally friendly. Consumer knowledge, environmental quality credibility, information clarity, persuasiveness and personal benefits stimulate consumer understanding and ecolabel perception (Taufique, Siwar, Chamhuri, 2016). Consumer green purchase behavior is decided by consumer's environmental concern (Joshi & Rahman, 2015). Environment built with products labeled 'environmentally friendly' frequently directed the consumer behavior (Haga, 2018). Ecolabel knowledge affects consumer attitudes toward environment to force ecologically conscious consumer behavior (Taufique, Siwar, Chamhuri, Sarah, 2016). Ecolabels are made to motivate consumer acts of buying environmentally friendly products and broadcasting green product statements (Ha, Hieu, My, 2019). However, most studies don't present a more detail justification about indicator measurement of ecolabel.

Theoretical framework
This research argues that ecolabel is predictive variable for environmental behavior. Recycling, eco-products, and green travel stimulate environmental behavior (Alcock, White, Pahl, Davidson, & Fleming, 2020). Ecolabel may be determined by environmentally informative instrument, environmentally friendly label, and environmental protection (Safitri, Umasih, Ibrahim, Sujarwo, Marini, & Wahyudi, 2019). Relationship summary hypothesized is explained in a model displayed in Figure 1.

Research design
Survey research was adopted in this study. The questionnaire gathered data from 146 students at Universitas Negeri Jakarta in East Jakarta in the province of DKI Jakarta. Data collected were related to ecolabel as the exogenous variable and environmental behaviour as the endogenous variable in this research.

The researcher used content analysis of the literature for environmental behavior based on Alcock, White, Pahl, Davidson, & Fleming (2020) consisting of three aspects ["recycling", "eco-products", and "green travel"], and ecolabel based on Safitri, Umasih, Ibrahim, Sujarwo, Marini, & Wahyudi (2019), which had three dimensions ["environmentally informative instrument", "environmentally friendly label", and "environmental protection"]. The conversion of these ideals was done into the questionnaire given to 146 participants.

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The questions regarding ecolabel consisted of three dimensions: environmentally informative instrument, environmentally friendly label, and environmental protection. The environmentally informative instrument dimension consists of three indicators (providing accessible message to consumer about the environmental attributes of the product, giving the consumer knowledge about the production standards of the product, and transmitting green product messages). Environmentally friendly label consists of three indicators (the products coming from environmentally friendly substances, communicating a sense of environmental consideration on the part of the manufacturer to consumer, and arousing consumer interest to purchase environmentally friendly products). Environmental protection dimension consists of three indicators (assisting to diminish the volume and toxicity of pollutants, encouraging consumer awareness development about product impact on the environment, and driving ecologically conscius consumer behavior).

The questions regarding environmental behavior consisted of the following three dimensions: recycling, eco-products, and green travel. Recycling consists of three indicators (converting items into reusable material, using items again, and reducing the cause of waste). Eco-product dimension consists of three indicators (buying eco-friendly products, using products not harming the environments, and choosing products contributing to green living). Green travel dimension consists of three indicators (respecting local cultures, traveling with environmentally conscious impact, and responsible travel practices paying attention to environmental sustainability).
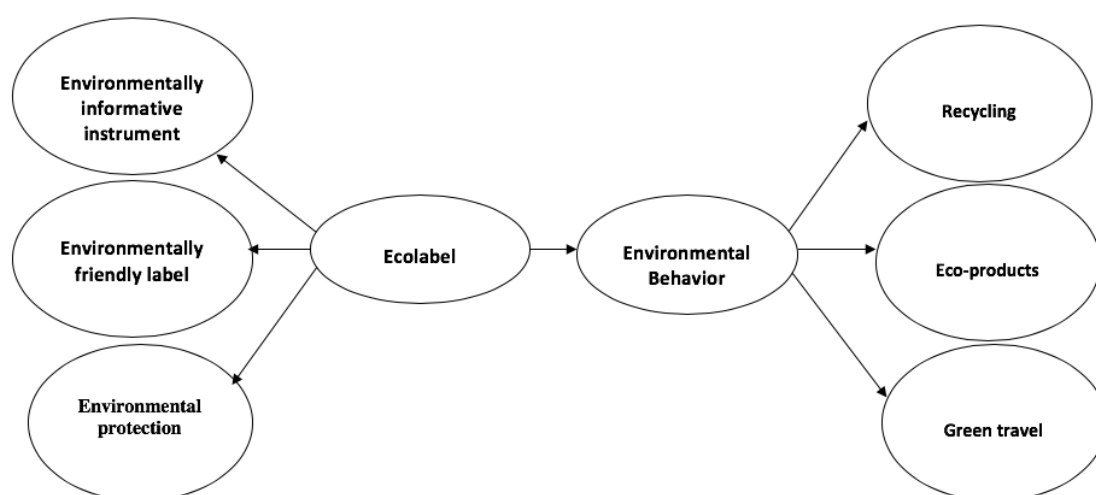

Figure 1. Theoretical Framework of the Study

Data analysis used the structural equation model (SEM) using IBM SPSS Statistics 24 and SPSS AMOS 24 with 2017 Edition (Edwita, Safitri, Maksum, Yunaz, Marini, & Muda, 2019; Maksum, Safitri, Ibrahim, Marini, & Wahyudi, 2019; Maksum, Safitri, Ibrahim, Marini, Wahyudi, 2020; Ibrahim, Safitri, Nuraini, Rihatno, Edwita, Marini, & Wahyudi, 2020; Marini, Maksum, Satibi, Edwita, Yarmi, & Muda, 2019; Marini, MS, Maksum, Satibi, Yarmi, & Wahyudi, 2019; Marini, Maksum, Edwita, Satibi, & Kaban, 2019; Marini, Safitri, & Muda, 2018; Hartati, Safitri, Nuraini, Rihatno, Marini, Wahyudi, 2020; Hadi, Yufiarti, Sumantri, Marini, & Wahyudi, 2020; Wibowo, Marini, Safitri, & Wahyudi, 2020; Nafiah, Riyadi, Sampurna, Marini, & Wahyudi, 2020). SEM was applied to examine the set of relationships between ecolabel as the exogenous variable and environmental behavior as the endogenous variable. Data were inputted using Excel by entering the scores of each item based on 146 participant responses with "strongly agree", "agree", "neutral", "disagree", and "strongly disagree" scored 5, 4, 3, 2, and 1, respectively, for positive questions and 1, 2, 3, 4, and 5, respectively, for negative questions.

Results and Discussion

The result of goodness of fit statistical analysis indicated that the value of Comparative Fit Index (CFI) and Incremental Fit Index (IFI) value reached 0.813 and 0.819 stating that the model is good fit. Based on SEM measurement result, the model proposed in this research is a fit model.

Table 1 and 2 showed that green travel as exogenous variable was associated with environmental behavior with correlation coefficients of 0.723, which were significant at the 0.05 levels according to the *t* statistics. The relationships between recycling and eco-products with environmental behavior were not supported in this study. This result is similar to that of the study of Alcock, White, Pahl, Davidson, & Fleming (2020) stating that environmental behavior was stimulated by green travel encouragement. However, this result is not consistent with the study finding that recycling and eco-products predicted environmental behavior (Alcock, White, Pahl, Davidson, & Fleming, 2020).

It can ben seen in Table 1 and 2 that converting items into reusable material, using items again, and reducing the cause of waste as observed variables had a positive association with recycling with correlation coefficients of 0.759, 0.793, and 0.559, respectively, which were significant at the 0.05 level according to the *t* statistics. Buying eco-friendly products, using products not harming the environments, and choosing products contributing to green living as observed variables were positively relationships with eco-products of 0.514, 0,445, and 0.437, respectively, which were significant at the 0.05 level based on the *t* statistics. Respecting local cultures and ways of life, traveling which is environmentally-conscious and low-impact, and responsible travel practices paying attention to environmental sustainability as observed variables had positive relationships with green travel of 0.191, 0,656, and 0.787, respectively, which were significant at the 0.05 level based on the *t* statistics. These study results were in line with the study finding that doing recycle items rather than throwing them away, buying eco-friendly products and brands, choosing to walk or cycle instead of using car stimulated recycling, eco-products, and green travel (Alcock, White, Pahl, Davidson, & Fleming, 2020). It can be seen the structural model in Figure 2.

Table 1. Measurement model test (Regression weights: Group number 1 – Default model)

			Estimate	Standard Error	Critical Ratio	Probability	Label
EBV	<---	ECL	0.372	0.215	1.729	0.084	
RCL	<---	EBV	4.898	2.530	1.936	0.053	
EPD	<---	EBV	2.490	1,367	1.822	0.068	
EII	<---	ECL	2.687	0.726	3.700	***	
EFL	<---	ECL	1.739	0.515	3.378	***	
EPT	<---	ECL	1.000				
GTV	<---	EBV	1.000				
EC3	<---	EII	1.000				
EC2	<---	EII	0.934	0.101	9.203	***	
EC1	<---	EII	0.324	0.114	2.835	0.005	
EC6	<---	EFL	1.000				
EC5	<---	EFL	1.260	0.238	5.289	***	
EC4	<---	EFL	1.792	0.271	6.600	***	
EC9	<---	EPT	1.000				
EC8	<---	EPT	1.718	0.502	3.419	***	
EC7	<---	EPT	0.458	0.256	1.790	0.073	
EB1	<---	RCL	1.000				
EB2	<---	RCL	1.191	0.136	8.782	***	
EB3	<---	RCL	0.798	0.127	6.277	***	
EB4	<---	EPD	1.000				

			Estimate	Standard Error	Critical Ratio	Probability	Label
EB5	<---	EPD	0.965	0.292	3.305	***	
EB6	<---	EPD	0.888	0.271	3.270	0.001	
EB7	<---	GTV	1.000				
EB8	<---	GTV	3.196	1.614	1.980	0.048	
EB9	<---	GTV	4.023	2.023	1.988	0.047	

Table 2. Measurement model test (Standardized regression weights: Group number 1 – Default model)

			Estimate
EBV	<---	ECL	0.728
RCL	<---	EBV	1.013
EPD	<---	EBV	0.728
EII	<---	ECL	0.965
EFL	<---	ECL	1.051
EPT	<---	ECL	0.735
GTV	<---	EBV	0.723
EC3	<---	EII	0.822
EC2	<---	EII	0.728
EC1	<---	EII	0.248
EC6	<---	EFL	0.538
EC5	<---	EFL	0.561
EC4	<---	EFL	0.823
EC9	<---	EPT	0.430
EC8	<---	EPT	0.604
EC7	<---	EPT	0.202
EB1	<---	RCL	0.759
EB2	<---	RCL	0.793
EB3	<---	RCL	0.559
EB4	<---	EPD	0.514
EB5	<---	EPD	0.445
EB6	<---	EPD	0.437
EB7	<---	GTV	0.191
EB8	<---	GTV	0.656
EB9	<---	GTV	0.787

Notes:
EBV = Environmental behavior
ECL = Ecolabel
RCL = Recycling
EPD = Eco-products
GTV = Green travel
EII = Environmentally Informative instrument
EFL = Environmentally friendly label
EPT = Environmental protection
EC1 = Providing accessible message to consumer about the environmental attributes of the product
EC2 = Giving the consumer knowledge about the production standards of the product

| EC3	=	Transmitting green product messages
EC4	=	Indicating the products coming from environmentally friendly substances
EC5	=	Communicating a sense of environmental consideration on the part of the manufacturer to consumer
EC6	=	Arousing consumer interest to purchase environmentally friendly products
EC7	=	Assisting to diminish the volume and toxicity of pollutants
EC8	=	Encouraging consumer awareness development about product impact on the environment
EC9	=	Driving ecologically conscius consumer behavior
EB1	=	Converting items into reusable material
EB2	=	Using items again
EB3	=	Reducing the cause of waste
EB4	=	Buying eco-friendly products
EB5	=	Using products not harming the environments
EB6	=	Choosing products contributing to green living
EB7	=	Respecting local cultures and ways of life
EB8	=	Traveling which is environmentally - conscious and low-impact
EB9	=	Responsible travel practices paying attention to environmental sustainability
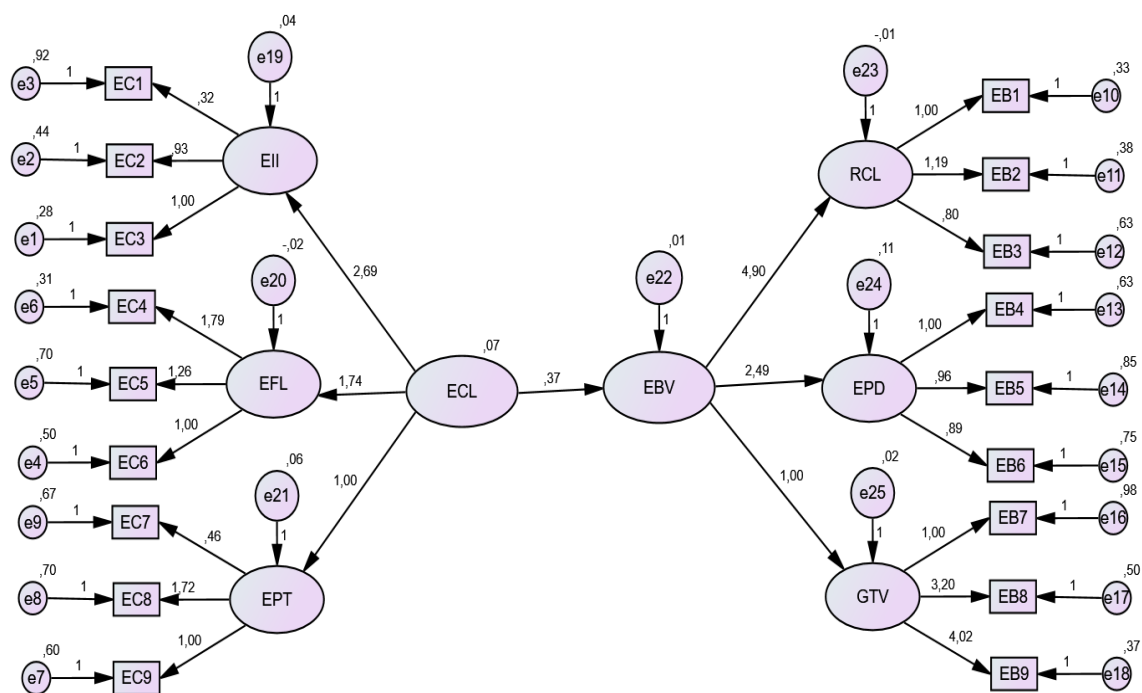
Figure 2. The Structural Model

It can be seen in table 1 and table 2 that environmentally Informative instrument, environmentally friendly label, and environmental protection have positive association with ecolabel of 0.965, 1.051, and 0.735, respectively. These values were significant at the 0.05 levels of t statistics. These findings were similar to the research indicating that environmentally informative instrument, environmentally friendly label, and environmental protection affect ecolabel helping to foster and develop consumer awarenesss of environmental conservation (Safitri, Umasih, Ibrahim, Sujarwo, Marini, Wahyudi, 2019)

In table 1 and table 2, it can be seen that providing accessible message to consumer about the environmental attributes of the product, giving the consumer knowledge about the production standards of the product, and transmitting green product messages have significant positive association with of environmentally Informative instrument of 0.248, 0.728, and

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0.822, respectively. This result was the same as the study found that ecolabels was affected by motivating consumer acts to purchase environmentally friendly products through broadcasting green product messages (Haga, 2018).

Table 1 and table 2 displayed that the products coming from environmentally friendly substances, communicating a sense of environmental consideration on the part of the manufacturer to consumer, and arousing consumer interest to purchase environmentally friendly products have significantly positive association with environmentally friendly label of 0.823, 0.561, and 0.538, respectively. These results were similar to the study stated that ecolabels are produced in providing support to the consumer to buy environmentally friendly products (Haga, 2018).

In table 1 and table 2, it can be shown that encouraging consumer awareness development about product impact on the environment and driving ecologically conscius consumer behavior have significant positive association with environmental protection of 0.604 and 0.430, respectively. However, association between assisting to diminish the volume and toxicity of pollutants with ecolabel was not supported in this study. These findings were in line with the study stating that environmental quality credibility was positively connected with consumer understanding and ecolabel perception (Safitri, Nuraini, Rihatno, Kaban, Marini, Wahyudi, 2020).

A direct effect of ecolabel on environmental behavior was not supported in this study. This result was not in line with the findings of the study of Taufique, Vocino, & Polonsky (2016) which stated that consumer knowledge and trust in ecolabel could affect environmental consumer behaviour.

Conclusion

An evidence-based model for environmental behaviour in the context of ecolabel is offered by this research. Green travel has positive association with environmental behavior. However, the relationships between recycling and eco-products with environmental behavior were not supported in this study. Environmentally informative instrument, environmentally friendly label, and environmental protection have positive association with ecolabel. Relationship between ecolabel and environmental behavior was not supported in this study.

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