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Effect of Environmental Optimism on Responsible Electricity Consumption with Price Concern as a Moderator

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Abstract
The study aimed to determine the effect of environmental optimism, as a cognitive–emotional factor, on the responsible use of electricity. Furthermore, it investigated the moderating effect of consumer concern on the price of electricity. An online survey was conducted on 345 young adults in Jakarta selected through the snowball sampling method. Data were analyzed using JASP version 15.0 and IBM SPSS Statistics version 23 reinforced with PROCESS macro. Simple linear regression analysis demonstrated that environmental optimism significantly explains the variance in electricity conservation behavior. The moderating effect of price concern was also substantiated by the result of the data analysis, thus the interaction between environmental optimism and dichotomous predictors of price concern (i.e. high vs low) was found to be statistically significant in moderating the effect of environmental optimism toward electricity conservation behavior. In conclusion, when consumers are initially dominated by price concern (a rational extrinsic motivator), then it reduces the effect of environmental optimism (an emotional intrinsic motivator) on responsible electricity consumption.

Keywords
economic behavior, environmental optimism, responsible electricity consumption, carbon footprint

Throughout the history of man, the advancement of society and technologies was mainly promoted to meet the desires for comfort, mobility, security, power, enjoyment, and ease of everyday living. The process of creating this *ideal* living space results in a major by-product of modern living, that is, carbon footprint, which may significantly alter the condition of the natural environment by contributing significantly to climate change. Such an impact to the environment may be extremely damaging.

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With a population of over 250 million, Indonesia ranked 10th among nations with the largest CO_2 emissions, which accounted for 1.48% of the total CO_2 emission worldwide at a staggering 566 $MtCO_2$ in 2020 (Climate Transparency, 2021; Enerdata, 2021). The major contributors to the total CO_2 emission in Indonesia are the industrial, transport, and power sectors at 37%, 30%, and 27%, respectively (Figure 1).

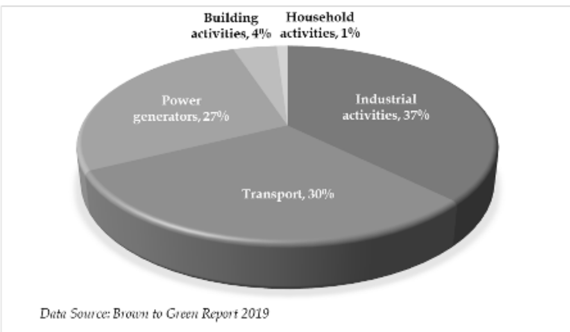


Figure 1. *Fossil Fuel CO_2 Emission by Sector*

Burning of fossil fuel (i.e., coal, oil, and natural gas) to generate energy that powers all sectors of human activities is a major contributor to the high amount of CO_2 emission. In Indonesia, the primary forms of energy used are oil (47%), coal (13%), and gas (10%) (Climate Transparency, 2021; Enerdata, 2021). This demand for energy continues to increase with the increase in the demands of the transportation, power, and industrial sectors and household activities, especially in urban areas.

Consequently, Indonesia maintains a high level of dependency on fossil fuel, especially in the operation of power plants, where coal is predominantly used. In fact, more than 50% of the nation total utilization of coal is expended for electricity generation (Climate Transparency, 2021; Enerdata, 2021; Qodriyatun, 2021). The country has a total capacity of generating 70 GW of electricity using coal (52%), gas (28%), and oil (9%) (Country Energy Report: Indonesia, 2021).

To reconcile between the increased coal consumption and Indonesia's commitment to reduce CO_2 emission, it is increasing the share of renewable sources in its energy mix and is implementing clean coal technologies. Although this approach is very likely to be successful, producing significant results will take considerable time, as it turns out Perusahaan Listrik Negara Persero (PT. PLN/National Electricity Company, Ltd) stated in their business plan that coal-fired steam electric power plants (Pembangkit Listrik Tenaga Uap/PLTU) will still be maintained until the year 2028 (Qodriyatun, 2021).

In the meantime, if the awareness and engagement of the public can be increased regarding the importance of energy conservation, then CO_2 emission can be reduced, and global warming can be attenuated. A close inspection reveals that the consumption of electricity is prevalent among the household sector (43%), followed by the industry (34%) and services (22%) (Figure 2; Enerdata, 2021).

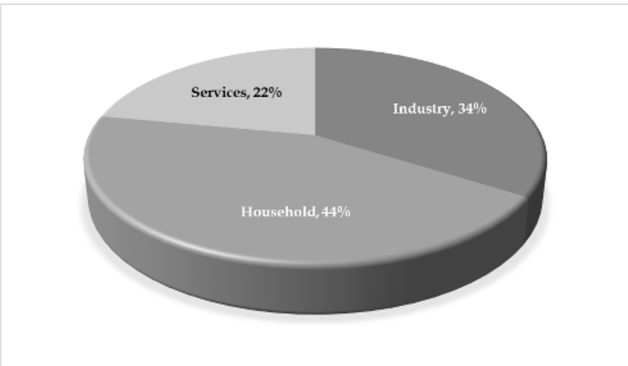


Figure 2. *Electricity Consumption by Sector*

The demand for electricity from the industrial sectors and households is high and grows at an alarming rate of 7% per year, which is faster than the economic and population growth. Java and Bali accounted for approximately 57% of Indonesia's total power consumption. This pattern is due to the fact that the majority of big urban cities are located in these islands with major industrial activities. Furthermore, Java and Bali are home to the largest populations in Indonesia. Hence, they cater to numerous households as well. Thus, assuming that intervention programs for increasing awareness and measures for electricity conservation among the public in Java and Bali will greatly benefit the nation is reasonable.

Electricity conservation behavior can be categorized into pro-environmental behavior, which includes actions undertaken with the intention to amend the impact of human manipulation on the environment. Previous studies and approaches that intend to promote pro-environmental behaviors have been conducted and tested, respectively. Approaches include religious and moral appeal, public education to alter attitude, incentive implementation, and community management system (Stern, 2000). However, evidence from previous studies revealed that such efforts for the implementation of policies and interventions rarely produce significant changes when applied as a single approach. Krishnamurthy & Kriström (2015) provided evidence for the substantial importance of electricity price in predicting consumption. However, the authors found that other non-economic factors may play a role in the adjustment of electricity efficiency behaviors. Linda et al. (2018) found that interventions for building awareness of energy conservation behavior are mostly conducted through directive appeals from figures of authority combined with monetary incentives, whereas consequences are regulated by controlling government policy and regulations. Nevertheless, this *stick-and-carrot* approach failed to produce the optimal level of awareness and actions among the public. Thus, Linda et al. suggested that future studies should build formulate alternative interventions for Indonesia.

Bažbauers et al. (2016) utilized a theoretical scenario based on a case study analysis of a system dynamics model in Latvia. The authors concluded that aggregate electricity savings could be doubled if household customers are concerned about environmental impacts. In line with the aforementioned study, Páramo et al. (2015) also argued that considering human behavior as a significant contributing variable is crucial for designing environmental protection policies. In general, gauging the degree of sensitivity (e.g., pessimism or optimism) of the society regarding environmental concerns is important for a country in predicting the reaction of the public toward policies and regulation to protect the natural resources of the nation. Taken individually, the effect of pro-environmental behavior on the reduction of the detrimental effects on the environment may seem insignificant. However, the act of the society as a whole will become meaningful over time (Páramo et al., 2015; Stern, 2000).

This study was designed after pondering on the abovementioned theoretical suggestions and in line with the propositions of Amir et al., 2005 that public policies, especially those related to environmental concerns; could largely benefit from research in psychology and behavioral economics. In addition, Mulyana and Siswandi (2018) expressed the urgency of developing comprehensive strategic policies to ensure energy sustainability that embraces local communities. As the capital city of Indonesia, Jakarta is the most populated city and is in dire need of a comprehensive intervention program for reducing electricity use among household consumers. Consequently, this study aimed to support the idea that environmental optimism, as a psychological aspect of an individual's awareness about environmental issue, holds the potential to motivate electricity conservation behavior among the public in Jakarta.

Literature Review

The study on human behavior sheds lights on how people make economic choices, such as in the context of pro-environmental behavior. Stern (2000) defined pro-environmental behaviors as behaviours that reduce the impact of human beings' actions toward the environment or improve the quality of our living space. Stern distinguished pro-environmental behavior into three types, namely, *environmental activism* (e.g., active engagement in environmental organizations and causes), *non-activist behaviors in the public sphere* (e.g., private support of pro-environmental actions and public policies), and *private sphere environmentalism* (e.g., personal consumption pattern based on environmental awareness). Based on the aforementioned categories, reducing the consumption of resources, such as saving energy (i.e., electricity), can be categorized as pro-environmental behavior (Lindenberg & Steg, 2013) in the private sphere.

Previous studies endeavored to determine the causal variables of pro-environmental behavior. The results indicated several categories of factors that more or less predict the occurrence of pro-environmental behavior, such as attitudinal, external/contextual forces, personal capabilities/disposition, and habit/routine. From this perspective, identifying the psychological factors that influence pro-environmental behaviors, such as electricity conservation behaviors, is becoming increasingly important, because such behaviors are the result not only of national responses to electricity price in maximizing utility but also of psychological factors, such as expectations, emotions, and mood (Kahneman, 2011; Lindenberg & Steg, 2013).

Previously, the research on energy-saving behavior failed to give sufficient importance on the prevalent nature of human decision making (Wilson & Dowlatabadi, 2007). Many sustainable consumption behaviors are a result of the consolidation of cognitive and affective responses. At a given moment, however, a particular salient attribute may influence a decision more than others did, which triggers the extrinsic or intrinsic motivation of consumers. Environmental optimism, that is, a positive outlook or attitude about the future condition of the environment and a tendency to anticipate a favorable outcome from life, can be considered a cognitive –emotional characteristic that triggers intrinsic motivation, which promotes responsible electricity use.

Environmental Optimism. Conceptualized as a cognitive–emotional characteristic, "optimism is comprised of a general, positive mood or attitude about the future and a tendency to anticipate a favorable outcome to life situations" (Scheier & Carver, 1985). Optimism is based on the belief that the future holds a positive promise, which when combined with a feeling of control over events that are about to unfold can lead to favorable behaviors and, therefore, ensure expected consequences (Baghkheirati et al., 2016). An optimistic standpoint that can lead individuals to anticipate future improvements in the environment should increase engagements in pro-environmental behavior (Kaida & Kaida, 2019). When this encouraging outcome occurs, it will emphasize that beliefs and expectations are consistent, which may further develop into self-fulfilling prophecies (Hommes, 2013).

Appraisal of future outcomes of the environment, which leads to positive feelings of hope and affinity toward the nature, may lead people to participate in sustainable consumption (White & Habib, 2018). In other words, when people are made aware that certain targeted behaviors are achievable and that overcoming impediments is possible, then optimism can be a very likely factor that will propel people toward the generation of favorable actions (Páramo et al., 2015; Peterson, 2000). Several scholars developed several approaches for fostering pro-environmental actions on the basis of this assumption. For example, Geller in Rydén et al. (2003) introduced a model of active caring for the environment. This model assigned responsibility for the future of the environment on individuals, which provided them with a sense of belonging and self-empowerment and, therefore, created an optimistic atmosphere for environmental concerns.

The impact of pro-environmental behaviors could only become visible when several individuals act together. These *agents of change* will not surface in the community when the society feels that they lack control over the environmental situation (Páramo et al., 2015) Hence, this scenario poses an interesting question of whether environmental optimism is indeed related to actual pro-environmental behavior.

Hitherto, studies on the impact of optimism on pro-environmental behaviors remain scarce. Pahl et al. (2005) found no association between comparative environmental optimism and pro-environmental behavior. However, the study focused only on environmental activism behavior. Given previous studies on optimism in general and on environmental optimism in particular, the current study aims to examine whether environmental optimism will exert an effect on a particular pro-environmental behavior in the private sphere, that is, responsible electricity consumption. Positive anticipation about the future of the environment is the most appropriate for this context due to the unique characteristic of the environmental detrimental process, which slowly transpires over time with extended consequences (i.e., a concept called *temporal* environmental optimism) (Gifford et al., 2009) Against this background, this study presents the following hypothesis:

Hypothesis 1: Environmental optimism will significantly positive influence responsible electricity consumption.

In other words, favorable expectations about the future condition of the environment will lead to more efficient electricity consumption, which is expressed in various electricity conservation actions.

Price Concern. Bažbauers et al. (2016) proposed that electricity consumers can be divided into two groups based on their motivation in undertaking electricity efficiency. The first group consists of consumers motivated by economic gain, that is, they mainly undertake energy efficiency measures due to their concern over the tariff of electricity. For this group of consumers, price concern is the most significant factor for electricity conservation behavior. The second group comprises consumers who are predominantly environmentally motivated and take electricity conservation actions due to environmental concerns. Therefore, price concern is the least important factor for electricity conservation behavior.

Abrahamse et al. (2005) and Wilson and Dowlatabadi (2007) stated that incentives can only be effective when they are salient for consumers at the moment of decision making. Therefore, launching campaigns that promote awareness of the connection between energy use and environmental problems is important. Another downside of applying monetary incentives as a regulation policy is the fact that the attractiveness of incentives varies across groups of consumers (Wilson & Dowlatabadi, 2007)

White and Habib (2018) and Wilson and Dowlatabadi (2007) argued that incentives influence energy consumption in circumstances where they act as an extrinsic motivation factor that creates external benefits for the consumer. The initial introduction of incentives as an external motivation may reduce the onset of intrinsic motivation for engaging in a particular behavior due to the interaction effect between personal and contextual factors, where the salience of one will constrain the emergence of the other. Consequently, this study expects that price concern will exert a moderating effect in the relationship between environmental optimism and electricity conservation behavior (Figure 3).

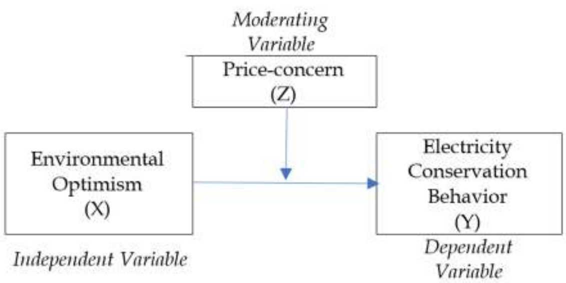


Figure 3. *Effect of Price Concern on the Relationship Between Environmental Optimism and Electricity Conservation Behavior*

Hence, this study endeavored to find evidence that varying degrees of price concern among consumers will moderate the effect of environmental optimism on electricity conservation behavior (Figure 3). The theoretical assumption is that the effect of environmental optimism on electricity conservation behavior is dependent on whether consumers display high or low levels of price concern. The initial emphasis on price concern on the decision to act responsibly with regard to electricity consumption may alter the effect of environmental optimism on this behavior. This notion led to the development of the next hypothesis.

Hypothesis 2: Price concern among the groups of consumers will moderate the relationship between optimism toward responsible electricity consumption.

This hypothesis indicates that when reduced electricity use is mainly driven by the motivation to lessen electricity cost, then the effect of environmental optimism toward responsible electricity consumption will be less significant compared with when environmental concerns initially compel motivation.

Methods

Participants

This study used a non-probability sampling method called snowball sampling, which is a form of convenience sampling. The researcher requested the participants to recruit others through their network of friends. The study selected this method, because it is suitable for studies conducted online and provides the participants with opportunities to share the study with others via a weblink or social media (Goodwin & Goodwin, 2017). The online survey platform utilized for this study was Lime Survey. The online questionnaire was designed with a brief introduction that enabled the participants to provide informed consent before proceeding with the actual survey.

Data were collected from 401 young adults in Jakarta aged 18 to 29 years. However, 35 participants were excluded due to failure to complete the survey and due to missing data, which are essential for fulfilling the objective of this study. Furthermore, another 21 participants were excluded during statistical analysis, because their data represented outliers. A closer inspection revealed that the majority produced the highest or lowest score (i.e., 5 or 1 on the Likert-type scale) without discrimination for all items.

Consequently, the final number of participants was 345, which were further differentiated into two groups, namely, the high price-concern group (n= = 100) and the low price-concern group (n = 245). Members of the high price-concern group are those living independently and are responsible for paying the electricity bill

Table 1. *Demographic information of participants*

		Low Price Concern (*n*)	High Price Concerned (*n*)	Total Participants (*N*)
Age	Mean (*M*)	20.67	21.75	20.98
	SD	2.37	3.37	2.73
	Minimum	18	18	18
	Maximum	29	29	29
Sex	Male	113	47	160
	Female	132	53	185
	N	*245*	*100*	*345*
Occupation	Students	189	61	250
	Employee	42	30	72
	Entrepreneur	4	9	13
	Freelance	7	0	7
	Not working	3	0	3
	N	*245*	*100*	*345*

every month, whereas members of the low price -concern group are sharing the same household with their parents and are not responsible for paying the electricity bill every month. Table 1 provides the demographic profile of the participants.

Instruments

This study utilized a self-report questionnaire to measure the variables involved. Hence, the study developed two scales for this purpose, namely, the Electricity Conservation Scale (ECS) and the Environmental Optimism Scale (EOS).

Electricity Conservation Scale. This study developed the ECS to measure efficient electricity use. A total of 19 items were constructed to measure electricity consumption based on the grouping of indicators by Bažbauers et al. (2015): lighting, household electrical appliances, and climate control equipment (e.g., heater, air conditioner, and domestic hot water). Items were rated using a five-point Likert-type scale (1 = never; 2 = rarely; 3 = sometimes; 4= often; 5 = always). The results of a pilot study indicated good internal consistency and reliability for the full ECS scale (Cronbach's a = 0.80). The individual score of the participants was calculated as the average of their scores across 19 items (Table 2).

Table 2. *List of items of Electricity Conservation Scale*

1. Turn the light off when it is not needed
2. Make sure that the lights are off before leaving a room
3. Use the appropriate power and size of light bulbs according to needs
4. Use natural light as a source of lighting
5. Use energy saving light bulbs (LED, CFL, or incandescent energy)
6. Turn off household electrical appliances when they are not required
7. Pull the electrical plug from the wall outlet when not in use
8. Leave electrical appliances on stand-by mode (not turned-on but still attached to the power source)
9. Turn off PCs/laptops when they not in use (shut down, not in *sleep* or hibernate mode)
10. Set the PCs/laptops feature to turn off the screen when they are not in use for a certain amount of time
11. Turn off the AC when not in use
12. Set a moderate temperature for the AC
13. Make sure that the room with a turned-on AC is completely sealed (do not open the door or window for too long)
14. Reduce the use of AC when the weather is not too hot
15. Choose electronic appliances that consume the least energy
16. Make sure that the refrigerator door is not open for too long
17. Wash clothes manually instead of using the washing machine when the load is small
18. Set a moderate temperature for the iron according to needs
19. Reduce the use of warm water to take a bath (e.g., use cold water in warm/hot weather)

Environmental Optimism Scale (EOS). The EOS was developed as a modification of the environmental future scale developed by Gifford et al. (2009). It is intended to measure temporal environmental optimism (i.e., how likely that the condition of the environment will improve in the future) based on the assessment of the future state of 27 aspects of the environment. These items incorporate the quality of natural and the man-made environments, as well as society's ability to address environmental issues. Items were rated using a five-point Likert-type scale (1 = totally disagree; 2 = disagree; 3 = relatively agree; 4= agree; 5= totally agree). The findings of a pilot study indicated excellent internal consistency and reliability for the full EOS scale (Cronbach's a = 0.95). The individual score of the participants was calculated as the average of their scores across 27 items (Table 3).

At the end of the questionnaire, several items were used to collect demographic information, such as age, occupation, gender, whether the individual is living with their parents or independently (e.g., boarding house or rented house), and whether the participant is responsible for paying the electricity bill every month.

Table 3. *List of items of Electricity Optimism Scale*

Conditions of the following environmental aspects will improve in the future:

1. Fresh water supply
2. Rivers and lakes
3. Level of biological diversity
4. Air quality
5. Urban parks and green open spaces
6. Forests
7. Impact of motor vehicles on the environment
8. Impact of human population on the environment
9. Greenhouse gas effect
10. Fishery
11. Quality of environmental esthetics
12. Management of household waste
13. Management of synthetics fibers and gasses
14. Management of hazardous nuclear waste
15. Quality of soil and agricultural requirement
16. Management of natural disasters
17. Management of visual pollution (e.g., billboards, derelict structures, and slums)
18. Effect of pesticides
19. Management of acid rain
20. Management of air pollution
21. Impact of mining on the environment
22. Existence of wildlife diversity
23. Maritime
24. Impact of fossil fuel (i.e., coal, oil, and natural gas) usage on the environment
25. Agriculture and plantation
26. Offshore oil pollution
27. Management of industrial waste and byproducts

Data Analysis

The collected data were analyzed using two computer-based applications, namely, Jeffrey's Amazing Statistics Program (JASP) version 15.0, which provided the methods for linear regression analysis required to test the hypotheses (van Kesteren, 2020), and IBM SPSS Statistics version 23 reinforced with the PROCESS macro (Hayes, 2018).

Hypothesis Testing

Hypothesis 1. A simple bivariate linear regression was applied on the overall data to test for the first hypothesis:

$$Y = a + bX + e1,$$

where X and Y denote environmental optimism and electricity conservation behavior, respectively. The regression coefficient is b, and when statistically significant, environmental optimism influences electricity conservation behavior.

Hypothesis 2. Linear regression analysis was the statistical method used to test the moderating effect of a dichotomous variable (i.e., high versus low levels of price concern) on a dependent variable (i.e., electricity conservation behavior; Figure 3).

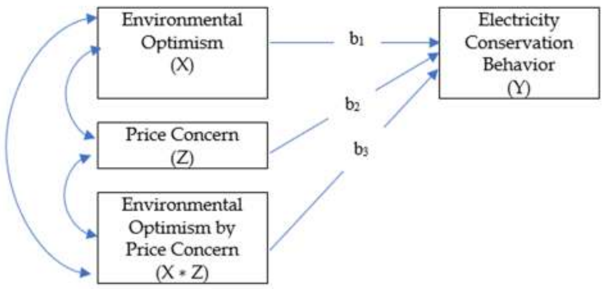
The study then developed a path model (Figure 4) to test for the significance of the moderating effect by conducting multiple regression and adding the cross-product of the predictor variable (i.e., environmental optimism). A dummy variable takes a value of 1 for the high price concern group; otherwise, it takes a value of 0 (Jose, 2013; Keith, 2019; Hayes, 2018).

To test the proposed moderation hypothesis, multiple regression was performed using three predictive terms, namely, the predictor variable, the moderator variable, and their interaction (predictor ∗ moderator), which is derived as follows:

$$Y = i1 + b1X + b2Z + b3XZ + e1.$$

The basic relationship among the variables is the association between environmental optimism

Figure 4. *Moderating Effect of Price Concern on the Effect of Environmental Optimism on Electricity Conservation Behavior*



(X) and electricity conservation behavior (Y), which is assumed significant and positive and previously tested as Hypothesis 1. The moderator variable, namely, price concern, was introduced to verify whether it can significantly alter this basic relationship. The proposed moderation, if existent, should be evident in the interaction term (X ∗ Z), which predicts the outcome (Y). The regression coefficient for X ∗ Z is b3 when statistically significant. In other words, the effect of environmental optimism on electricity conservation behavior varies on the high or low levels of price concern of consumers.

Results

Descriptive Statistics and Correlation of Variables. Table 4 presents the mean, standard deviation, and other descriptive statistics of average scores for environmental optimism and electricity conservation behavior from the five-point scales. The results demonstrate that the mean of environmental optimism is 3.34 with a standard deviation of 0.64, whereas the mean for electricity conservation behavior is 3.89 with a standard deviation of 0.48. The two variables are positively correlated with Pearson's r = 0.67, which is significant with a probability value of <0.001 (one-tailed test).

Statistical Test for Hypothesis 1. A simple linear regression analysis was conducted on the data to test Hypothesis 1. The scores for electricity conservation behavior were regressed on the scores for environmental optimism. Table 5 presents the statistical significance of the regression test (F-coefficient: 280.22; p < .001). This finding indicates that environmental optimism explains 0.45 or 45% of variance in electricity conservation behavior, which is represented by R-squared. The standardized regression coefficient (β) is 0.67 (t = 16.74; p < 0.001), which indicates

Table 4. *Descriptive Statistics for Electricity Conservation Behavior and Environmental Optimism Scales Scores*

	r	N	Range	Min	Max	Sum	Mean	SE of Mean	SD	Variance
Electricity conservation behavior	0.67***	345	2.68	2.14	4.82	1343.54	3.89	0.02	0.48	0.17
Environmental optimism		345	3.41	1.59	4.90	1151.93	3.34	0.03	0.64	0.41

****Significant at loc .001*

Table 5. *Statistical Significance of the Regression of Electricity Conservation Behavior on Environmental Optimism*

Coefficients[a]								
		Unstandardized		**Standardized**			**95% CI for *b***	
Model		**b**	**Std. Error**	**Beta (*β*)**	**t**	**p**	**Lower Bound**	**Upper Bound**
H_0	Intercept (Constant)	2.43	0.089		27.29	< .001	2.25	2.60
	Environmental Optimism	0.44	0.026	0.67	16.74	< .001	0.39	0.49
								R-squared = 0.45 *F(1, 343) = 280.22, p < .001*

Note: Null model includes
a. Predictor: (constant) environmental optimism
b. Dependent variable: electricity conservation behavior

Table 6. *Descriptive statistics by groups based on price concern*

	Environmental Optimism		**Electricity Conservation Behavior**	
	Low Price Concern (Group 0)	**High Price Concern (Group 1)**	**Low Price Concern (Group 0)**	**High Price Concern (Group 1)**
Valid (n)	245	100	245	100
Mean	3.33	3.35	3.88	3.93
Std. Deviation	0.64	0.64	0.43	0.38
Minimum	1.59	1.74	2.13	2.82
Maximum	4.90	4.90	4.82	4.82

that environmental optimism significantly predicted electricity conservation behavior.

Statistical Test for Hypothesis 2. Table 6 presents the descriptive statistics for the groups based on the high or low levels of price concern of the participants.

Multiple Regression Testing for the Moderating Interaction. Table 7 depicts the regression coefficient for X ∗ Z (b3 = −0.21), which is statistically different from zero ($\beta = -0.79$; $t = -3.70$; $p < 0.001$). Thus, the effect of environmental optimism on electricity conservation behavior is significantly dependent on the high or low levels of price concern of consumers. In other words, the effect of environmental optimism on electricity conservation behavior is more prevalent in the low price-concern group.

Comparison Between Regression Analyses on High- and Low-Price Concern Groups. The simple linear regression analysis on both groups corroborates the positive association between environmental optimism and electricity conservation behavior. Nevertheless, environmental optimism explains only 23% of variance in electricity conservation behavior for the high price-concern group but 55% for the low price-concern group. The significance of the regression coefficient for the high price-concern group is also lower compared with that of the low price-concern group ($\beta = 0.48$; $t = 5.45$; $p < .001$ and $\beta = 0.74$; $t = 17.16$; $p < .001$, respectively).
Figure 5 illustrates the different regression lines for Group 0 (low price concern) and Group 1 (high price concern).

Table 7. *Regression coefficients of the regression of electricity conservation behavior on environmental optimism moderated by Price-concern*

Coefficients[a]								
		Unstandardized		**Standardized**			**95% CI for b**	
Model		**b**	**Std. Error**	**Beta (β)**	**t**	**p**	**Lower Bound**	**Upper Bound**
H_0	Intercept (Constant)	2.22	0.103		21.42	< .001	2.01	2.42
	ENVIRONMENTAL OPTIMISM (X)	b_1 0.49	0.03	0.76	16.36	< .001	0.44	0.56
	PRICE-CONCERN (Z)	b_2 0.75	0.193	0.82	3.88	< .001	0.37	1.13
	ENVIRONMENTAL OPTIMISM ∗ PRICE-CONCERN (X*Z)	b_3 −0.21	0.057	−0.79	−3.70	< .001	−0.32	−0.098
								R Square = 0.47 *F(3, 341) = 102.19, p < .001*

a. Dependent Variable: Electricity Conservation Behavior (Y)

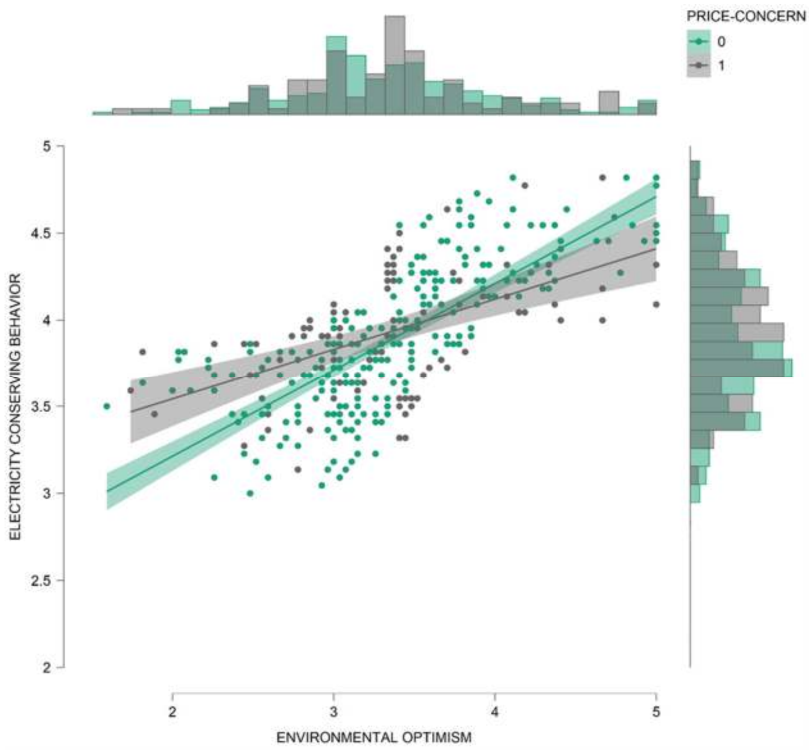


Figure 5. *Moderating effect of price concern on the association between environmental optimism and electricity conservation behavior (illustrated via regression lines)*

Discussion

As discussed in the Introduction, this study aims to collect evidence that environmental optimism motivates electricity conservation behavior. Furthermore, it is expected that price concern is a moderating factor of this relationship. Taken together, this study finds that the results supported Hypotheses 1 and 2 through statistical analysis of data. The overall analysis suggests that environmental optimism predicted electricity conservation behavior in the positive direction. Thus, when the participants feel optimistic that the future of the environment holds a chance to become better and when they believe that they can contribute to the betterment of this situation, then they can be motivated to do their share in electricity conservation. Thus, favorable expectations about the future of the environment serves to boost the feeling of responsibility and empowerment, which consequently lead to a more efficient electricity usage. This finding is in line with those of previous studies, which found that positive affect and concern about the environment trigger pro-environmental behavior (Rizkalla, 2018; White & Habib, 2018; Wilson & Dowlatabadi, 2007).

The effect of environmental optimism on responsible electricity consumption was slightly altered when price concern was introduced as a moderator. Signifying that when reduced electricity use among the participants was initially driven by the motivation to lessen electricity cost, then the effect of environmental optimism on responsible electricity consumption will become less immediate. Conversely, for participants without price concerns, their motivation for responsible electricity use seems to be initially compelled by environmental concerns. These results indicate that the extrinsic motivation of rational pricing concerns drove the onset of efficient electricity use among individuals who are concerned about paying the electricity bill. Therefore, they are less sensitive toward cognitive–emotional factors, such as environmental optimism, which can be more successfully used as an intrinsic motivation. This particular finding addresses the niche in previous studies, which paid less attention on the interplay between electricity tariff intervention and other underlying psychological determinants of energy consumption behavior (Abrahamse et al., 2005).

Practical Implications. The implication of this finding is that given the dire issue on fostering sustainable consumption, the investigation of psychological factors, such as environmental optimism, could contribute to the development of comprehensive intervention programs. In other words, managing the optimism of consumers is very likely important for empowering pro-environmental behaviors, and, therefore, maximizes the impact of available policies designed to promote such behaviors, which were mainly developed as incentive-based regulations.

Policies that are reliant on rational concerns about the tariff of electricity could be effective to a certain extent, that is, when consumers continue to remain sensitive about the increase in electricity bill. However, once this concern is eliminated, such as when consumers can afford and are willing to pay the price, then these policies will lose their effectiveness. Environmental concerns could be a determining factor among individuals who are uninterested in cutting costs. Thus, optimism about environmental protection should be fostered by providing ideal conditions for individuals to acquire this mindset. A single individual may only create a tiny amount of change. However, one can still act as an agent of change and can influence others to act in the aggregate and, thus, create a significant impact. Investigating sustainable energy consumption behavior through a multi-disciplinary perspective is important, instead of merely implementing electricity tariff regulation. In this manner, communities can be engaged to execute real actions toward overcoming environmental issues based on the existing environmental concerns, which may lead to more meaningful results.

Limitations and Further Study. This present study, regardless of the confirmation of the results, present an area for improvement. This study utilizes the snowball sampling method. Therefore, the generalization of the findings should be interpreted with caution within the context of the population as a whole. This study also focused on participants with an average monthly expenditure below 5 million rupiah per month. Therefore, conducting further studies on samples of participants that better represent the entire population in Jakarta would be interesting.

The results could be enhanced further if combined with further studies that investigate other factors that may exert effects on the electricity consumption of consumers, such as the concept of habit; self-efficacy, which gives a sense of empowerment; or community-based interventions, to create movements on pro-environmental behaviors. These factors could be utilized in the future to develop comprehensive public policies in Jakarta and other urban cities in Indonesia to boost responsible electricity consumption.

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