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Plugged in and charging: Environmentalism Factors Does Affect Behavioral Intention to Purchase Electric Cars in Indonesia, But Non-Environmental Factors are Important Too

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PLUGGED IN AND CHARGING: ENVIRONMENTALISM FACTORS DOES AFFECT BEHAVIORAL INTENTION TO PURCHASE ELECTRIC CARS IN INDONESIA, BUT NON-ENVIRONMENTAL FACTORS ARE IMPORTANT TOO

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ABSTRACT

The adoption of electric cars is considered a solution for promoting energy conservation and reducing air pollution. However, electric car purchasing in developing countries is currently at a nascent stage. More research is required to see if environmental factors do matter in the consumer's decision to purchase an electric car. This study aims to examine the relationship between environmental factors and the behavioral intention to purchase electric cars in Indonesia. The study recruited 300 respondents from five major areas of Java Island who are aware of electric cars but currently owned only non-electric cars. The study integrated the theory of planned behavior and the norm activation model to analyze the data. The findings suggest that perceived behavioral control plays a key role in mediating the effect of environmental factors on the intention to purchase electric cars. The awareness of consequences and ascription of responsibility also influence personal norms which affect the purchase intention. The study concludes that environmentalism factors do contribute to the purchase intention of electric cars, but it is mediated by perceived behavioral control. Additionally, non-environmental factors such as affordability and convenience also play a crucial role.

Keywords: *Electric cars; Environmental concern; Theory of planned behavior; Normative activation theory; Indonesia*

INTRODUCTION

This study is about the influence of environmentalism on behavioral intention to purchase electric cars. It examines the relationship between environmentalism and behavioral intention to purchase electric cars in Indonesia. The study also examines the influence of environmentalism and non-environmental factors on behavioral intention to purchase electric cars in Indonesia. The results show that environmentalism does have a significant positive effect on behavioral intention to purchase electric cars in Indonesia, but non-environmental factors are also important.

Currently, Indonesia is the fourth most populous country in the world and the 16th largest economy in the gross domestic product (World Bank, 2021). As the Indonesian economy grew rapidly, more vehicles demanded even larger fuel volumes. Even though Indonesia is a resource-rich country, oil production has substantially declined, and this is where the problem arises. There is an imbalance between demand and supply. Indonesia was officially recognized as a net oil importer country by OPEC in 2004 to keep up with the demand for fuel oil (Indonesian Ministry of Energy and Mineral Resources, 2012). This demand appears both as a challenge and an opportunity for new vehicle technologies to thrive that may bring economic development benefits.

Furthermore, as part of the developing world, Indonesia is also dealing with a high air pollution problem. IQAir (2021) released air quality data from 117 countries in the world for 2021 and stated that Indonesia was ranked 17th as the world's most polluted country. IQAir also found that the top most polluted areas in Indonesia are the big cities on Java Island, such as Bandung, Surabaya, Jakarta, and Semarang. One of the main causes of air pollution is emissions from transportation. It accounts for 25% of the world's total carbon emissions, according to a global study by Our World in Data (2020). The study also found that more than 70% of this carbon emission came from road vehicles, including cars, trucks, and buses. In conclusion, the transportation sector is one of the largest source of greenhouse gas emissions, which is also the main contributor to urban air pollution.

The Indonesian Ministry of National Development Planning (2011) stressed the importance of implementing emission mitigation plans. One of the options in the effort of mitigation is using electric vehicles to replace conventional cars equipped with an engine that runs by burning fuel oil. One method for decarbonizing the transportation sector is to use renewable energy. Electric vehicles have several advantages over conventional cars, including a minor environmental impact, high energy efficiency, and high driving performance.

In recent years, there has been a notable government-led effort to boost citizens' inclination towards transitioning to electric vehicles. Indonesia has experienced a relatively sluggish rate of electric vehicle adoption, prompting the government to enact a series of regulations and initiatives with the aim of achieving substantial growth in this sector. As part of these endeavors, the government has set ambitious targets, including the adoption of 2.1 million electric motorbikes and 2,200 electric cars by the year 2025. Additionally, a key objective outlined in the Republic of Indonesia's Presidential Regulation No. 22 of 2017, which pertains to the National Energy General Plan, is to enable the domestic production of 2,200 electric or hybrid cars.

However, the government's plan is still far from being realized, especially with the market potential owned by Indonesia. According to Yohannes Nangoi, chairman of the Association of Indonesia

Automotive Industries (GAIKINDO), in a news post in GAIKINDO (2021), The biggest reason for the slow pace, according to Nangoi, is the high price of electric vehicles. The price of conventional cars that dominate the market is under 300 million Rupiah or twenty-eight thousand AUD. In contrast, the general price of electric cars starts from 480 million rupiahs (44,500 AUD) and costs about 650 million rupiahs (61,000 AUD) on average. Examples of available electric cars in Indonesia, according to iNews.id (2022) are DFSK Gelora (480 to 510 million rupiah), Nissan Leaf (649 million rupiah), and Hyundai Kona (697 million rupiah). The higher price of electric vehicles than conventional cars make citizens reluctant to purchase them.

The Indonesian government aims to push the national production of electric vehicles, especially because Indonesia holds the largest nickel reserves, one of the rare earth elements in electric vehicle batteries (Huber, 2021). However, there are several challenges facing Indonesia in the electric vehicle industry. According to CNBC Indonesia (2021), the challenge rises due to the insufficient investment and time to build a battery factory. There is also an issue with the price of acquiring the technology, which will affect the end-product price. If the price is too high, it is at risk of not being accepted by the citizens. Furthermore, the government is challenged to support infrastructure such as car factories and charging stations, which requires a huge investment. Therefore, this paper aims to investigate whether environmentalism factors can overcome the challenges and encourage the purchase intention of electric cars in Indonesia.

METHODS

Hypotheses Development

With more electric vehicle brands entering Indonesia and the continuous efforts being made toward developing Indonesia's electric vehicles industry, the vehicle is expected to be adopted by more citizens. The public's pro-environmental behavior is expected to grow and lead to the intention to purchase electric vehicles and support the government's goals. This study investigates the factors affecting one's intention to purchase an electric car from self-interest and altruism, especially in the context of pro-environmental behavior.

The prevalent theories in the field of social marketing are the Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM). TPB, initially formulated and developed by Ajzen in 1991, evolved from the Theory of Reasoned Action proposed by Fishbein and Ajzen in 1975. Ajzen's TPB is a well-established model designed to elucidate how human cognition influences behavior. Numerous environmental studies have employed TPB to predict consumers' intentions to adopt eco-friendly products, as demonstrated by research conducted by Wu and Chen (2014), Chen and Hung (2016), and Yadav and Pathak (2016).

On the other hand, NAM was first introduced by Schwartz in 1997 to explore the impact of normative influences on altruistic behavior. This theory serves as another framework for explaining pro-environmental actions and has been utilized in studies examining the adoption of electric vehicles, as exemplified by the work of He and Zhan (2018). While TPB primarily focuses on self-control and self-interest, NAM places its emphasis on altruism and prosocial conduct, as noted by Steg and Groot (2010).

The subjective evaluation of an individual's particular behavior toward purchasing electric cars is called attitude and results from behavioral belief and outcome evaluation (Ajzen, 1991; Zhao et al., 2019). Environmental attitudes provide a good understanding of beliefs, interests, or rules that drive environmentalism or pro-environmental behavior (Fernández-Manzanal et al., 2007).

Ng and Cheung (2022) argues that imparting positive values and attitudes regarding environmental conservation to young individuals will result in a more favorable pro-environmental attitude and subsequent environmentally conscious actions. Consequently, a more positive attitude toward electric cars is hypothesized to lead to a stronger intention to purchase them. In summary, the following hypothesis is posited:

H1: Attitude exerts a positive influence on the intention to purchase electric cars

Subjective norm encompasses the influence of the social environment and public opinion on one's actions, closely tied to an individual's normative consciousness and their motivation to conform to societal expectations. These personal subjective norms are frequently shaped by the values and conduct of those around them, commonly referred to as social influence factors, as elucidated by Ajzen in 1987.

In situations where an individual is aware of the prevailing behavioral norms of others but lacks the inclination to align their actions accordingly, the impact of these norms on the individual's intentions may diminish. Consequently, greater pressure from others to purchase electric cars is hypothesized to strengthen the desire to acquire them. In summary, the following hypothesis is put forth:

H2: Subjective norm exerts a positive influence on the intention to purchase electric cars.

Perceived behavioral control relates to the ease or difficulty associated with engaging in a particular activity and is primarily influenced by two key factors: control beliefs and perceptual ability. Control beliefs encompass the factors individuals believe can either facilitate or hinder their actions. Concurrently, perceptual ability influences one's capacity to assess how certain factors may affect their behavior.

According to Ajzen (1991), individual income levels, product pricing, and the availability of opportunities are factors that can significantly impact people's engagement in specific behaviors. In cases where individuals struggle to recognize the influence of these factors, the effect of perceived behavioral control on their intentions may weaken. Consequently, the greater the resources at an individual's disposal when considering the acquisition of electric cars, the more robust their intention is likely to be. Thus, the hypothesis proposed is as follows:

H3: Perceived behavioral control exerts a positive influence on the intention to purchase electric cars

According to Fransson & Gärling (1999), environmental concern is an attitude or belief toward the importance of environmental issues. Environmental concern plays an important role in the intention to purchase electric cars. Prior research has shown that the characteristics included in TPB, namely attitude, subjective norms, and personal norms, moderate the influence of environmental concern on eco-friendly behavior (Paul et al., 2016; Bamberg, 2003).

The degree to which an individual has a good or bad evaluation of behavior is characterized by the attitude in the TPB model. A more optimistic mindset leads to more positive behaviors and the

other way around (Ajzen, 1991). In this study, attitude is defined as the evaluation that arises when faced with the choice to purchase electric cars.

Environmental concern has been demonstrated to affect attitudes toward environmentally friendly buying behavior in general in previous research (Albayrak et al., 2013). Similarly, Albayrak et al. found that environmental concern positively relates to subjective norms and perceived behavioral control. Considering the existence of those relations, the researcher formulated the following hypotheses:

H4: Environmental concern exerts a positive influence on the attitude toward purchasing electric cars

H5: Environmental concern exerts a positive influence on the subjective norm to purchase electric cars

H6: Environmental concern exerts a positive influence on the perceived behavioral control to purchase electric cars

A personal norm constitutes a set of principles and moral guidelines that shape an individual's behavior and can directly influence their actions. The stronger the personal norm, the more likely it is for an individual's behavior to align with the standards set by that personal norm, as discussed by Schwartz and Howard in 1981.

In the context of this study, the personal norm in question pertains to the obligation to purchase electric cars as a moral duty and code of conduct, driven by environmental concerns, particularly pollution. Failure to transition to electric cars is expected to evoke feelings of guilt, thereby motivating individuals to acquire electric cars. To summarize, the proposed hypothesis is as follows:

H7: Personal norms exert a positive influence on the intention to purchase electric cars.

Awareness of consequences entails recognizing the potential negative outcomes of failing to engage in pro-environmental behavior, such as the environmental consequences of not purchasing electric cars. Ascription of responsibility involves the belief that individuals should be held accountable for the adverse consequences of their failure to engage in pro-environmental behavior, as outlined by Schwartz and Howard in 1981 and Zhao *et al.* in 2019.

According to this study, those who do not purchase electric cars should be considered responsible for the pollution and environmental harm resulting from their actions. These two factors, mentioned earlier, are expected to directly and positively contribute to the formation of personal norms (Zhao et al., 2019). Individuals come to realize that the failure to acquire electric cars for energy conservation and emissions reduction would have significant environmental and societal ramifications, thereby reinforcing the development of personal norms. Consequently, the following hypotheses are proposed:

H8: Awareness of consequences exerts a positive influence on the formation of a personal norm to purchase electric cars.

H9: Ascription of responsibility exerts a positive influence on the formation of a personal norm to purchase electric cars.

H10: Awareness of consequences exerts a positive influence on the ascription of responsibility regarding the purchase of electric cars.

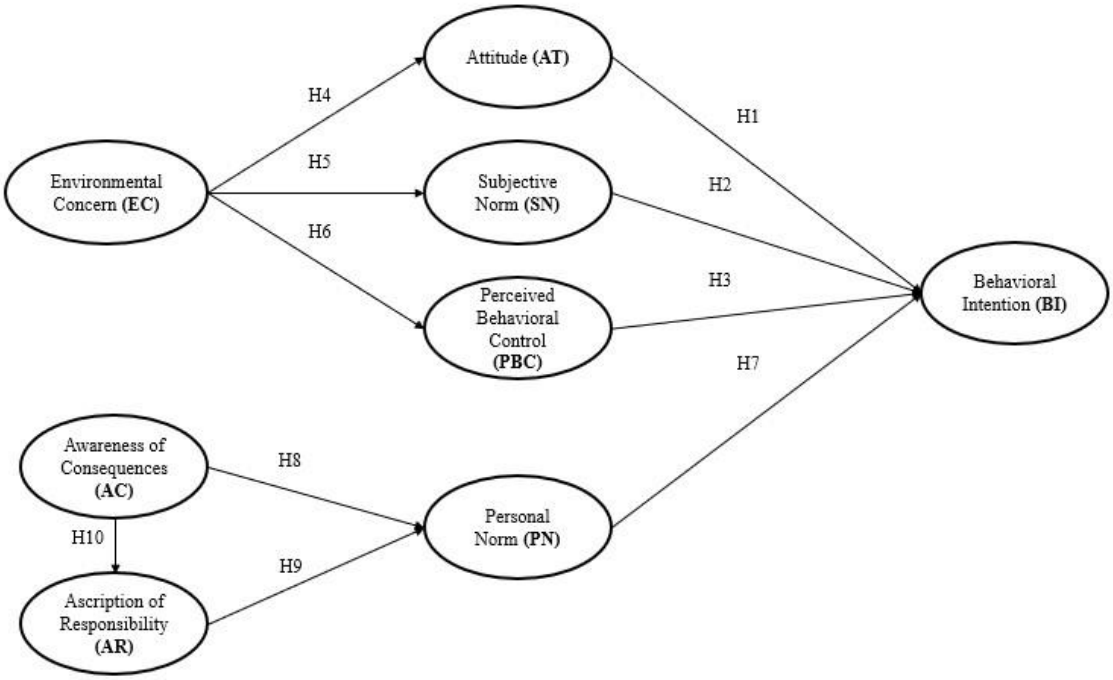

Figure 1. The research framework of this paper.

The theoretical framework employed in this study is based on the Theory of Planned Behavior and is utilized to analyze and elucidate the behavioral intentions of individuals in relation to the purchase of electric cars. To sum up, Figure 1 illustrates the research framework presented in this paper.

Questionnaire design

This study encompasses eight variables: environmental concern, awareness of consequences, ascription of responsibility, attitude, subjective norm, perceived behavioral control, personal norm, and behavioral intention. All measurements were assessed using a Likert scale with 7 points, ranging from "strongly disagree" (1) to "strongly agree" (7). The measurement items for each variable within the theoretical model were developed drawing upon the foundations of the Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM), as well as considerations related to environmental concerns and consumer behaviors associated with electric cars.

Table 1. Sociodemographic Characteristics of the Respondents.

	Full sample (N = 300)	*n*	%
Gender	Male	167	55.67%
	Female	133	44.33%

Age	26 to 41 years old	51	17.00%
	42 to 57 years old	212	70.67%
	58 to 67 years old	32	10.67%
	Above 67 years old	5	1.67%
Domicile	Greater Jakarta	156	52.00%
	Semarang	71	23.67%
	Bandung	43	14.33%
	Surabaya	16	5.33%
	Yogyakarta	14	4.67%
Income status	Aspiring middle-class	141	47.00%
	Middle-class I	88	29.33%
	Middle-class II	34	11.33%
	Upper class	37	12.33%

Table 2. Construct reliability and convergent validity

Constructs	Items	Factor loadings	Cronbach's α	CR	AVE
EC	EC1	0.867	0.890	0.923	0.566
	EC2	0.827			
	EC3	0.678			
	EC4	0.659			
AC	AC1	0.863	0.789	0.859	0.751
	AC2	0.913			
	AC3	0.837			
	AC4	0.854			
AR	AR1	0.805	0.921	0.944	0.609
	AR2	0.838			
	AR3	0.666			
	AR4	0.816			

Constructs	Items	Factor loadings	Cronbach's α	CR	AVE
AT	AT1	0.897	0.755	0.834	0.809
	AT2	0.932			
	AT3	0.844			
	AT4	0.921			
SN	SN1	0.871	0.917	0.941	0.701
	SN2	0.918			
	SN3	0.776			
	SN4	0.807			
PBC	PBC1	0.770	0.863	0.905	0.663
	PBC2	0.916			
	PBC3	0.522			
	PBC4	0.898			
	PBC5	0.897			
PN	PN1	0.817	0.878	0.916	0.733
	PN2	0.863			
	PN3	0.900			
	PN4	0.842			
BI	BI1	0.878	0.865	0.902	0.801
	BI2	0.945			
	BI3	0.902			
	BI4	0.852			

Sample and data collection

The population of this study is citizens from five urban areas in Java, Indonesia (i.e., Greater Jakarta, Bandung, Semarang, Yogyakarta, and Surabaya). The five areas were chosen because this study focuses on the impact of environmental issues, especially air pollution, and the five areas are among the top polluted areas in Indonesia (IQAir, 2021). Furthermore, these areas are the most populous urban areas on Java Island. They are known to be the center of their respective provinces'

government, culture, education, and business. With its nature, the people of the five big areas are expected to be more modern and know electric cars.

Furthermore, the respondents are male and female, 26 years and above. This study targeted generations that are already classified as adults according to Indonesian law, which is over 17 years old. Adults are believed to be mature enough to make purchasing decisions based on their values, concerns, and preferences. The Pew Research Center (2019), based on the United States Census Bureau, categorizes generations based on birth year. The generation considered mature as a whole are millennials, starting from those born in 1996 who were 26 years old in the year this study was developed.

A total of 360 questionnaires were distributed, yielding 300 valid responses. The demographic composition of the sample is presented in Table 1. Descriptive statistics for the constructs under investigation in this study, including the mean and standard deviation, are provided in Appendix 1.

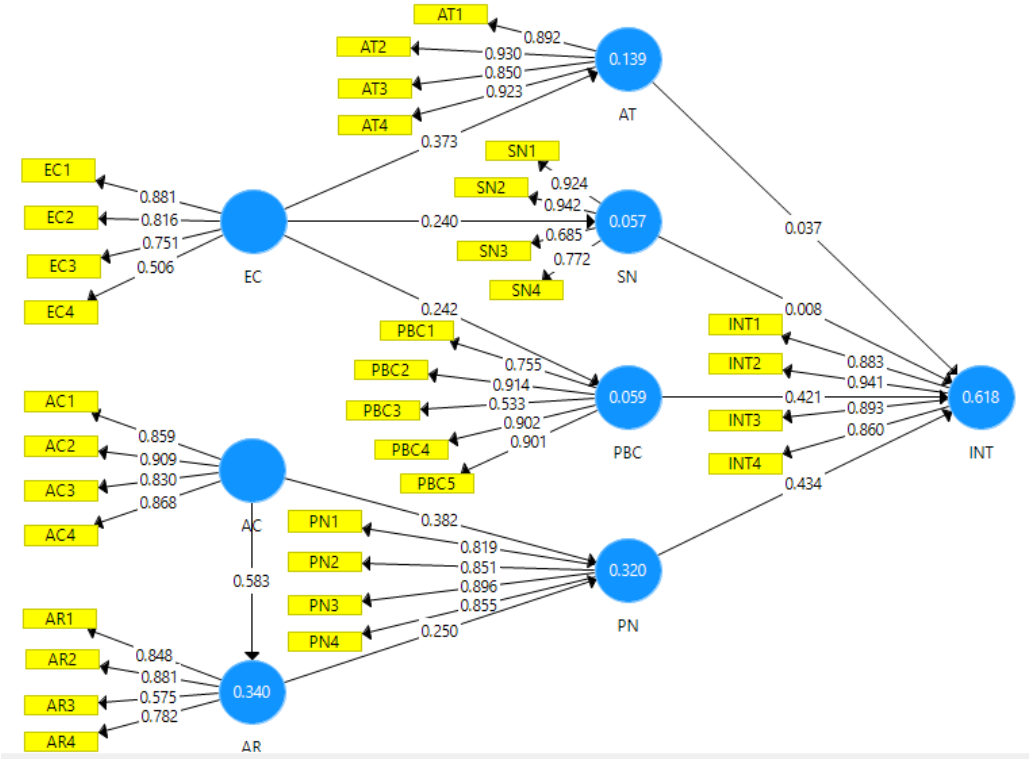

Figure 2. Study structural model (Outer model: Loading and R^2)

Data analysis

The Partial Least Squares Structural Equation Modeling (PLS-SEM) program and the SmartPLS 3.0 application were used in this research. There are two steps in using PLS-SEM to process data. Starting with the model requirements and on to the evaluation of the outer and inner models (Hair et al., 2017). The outer model, or measurement model analysis, looks at the link between the indicator variables and the related construct. In contrast, the inner model, or structural model analysis, examines the relationship between the assessed constructs.

RESULTS AND DISCUSSION

The result and discussion section report the study's findings, including the validity and reliability of the measurement, the result of the hypotheses testing, model fit statistics, implications, and limitation of the study.

Measurement model

The analysis of the measurement model included assessments of internal consistency, convergent validity, and discriminant validity for all variables. These tests also provided insights into the reliability and validity of the measurement model, as summarized in Table 2.

Reliability testing aimed to determine whether Cronbach's alpha values exceeded 0.7, as recommended by Hair et al. in 2017. In this study, all Cronbach's alpha coefficients ranged from 0.755 to 0.921, surpassing the 0.7 threshold. These findings affirm that the measurement scale used in this study is reliable and dependable.

Furthermore, the average variance extraction value (AVE) exceeded 0.5 for each construct. This observation aligns with the conclusions drawn by Fornell and Larcker in 1981, indicating that each construct exhibits strong convergent validity. In essence, these results suggest that the measurement model effectively captures and measures the intended constructs in this study.

Structural model

After establishing a robust measurement model, we employed Structural Equation Modeling (SEM) to assess the hypothetical structural framework. In this evaluation, the t-value and R-squared (R^2) indicators played a pivotal role in appraising the validity of our SEM.

Path coefficient analysis, a fundamental component of SEM, scrutinizes the direct impact of one variable on another. In contrast, R^2 delves into the degree to which independent factors elucidate variations in dependent variables. These R^2 values, as delineated by Chin in 1998, hold significant meaning: 0.67 signifies a substantial relationship, 0.35 suggests a moderate one, and 0.19 implies a weaker connection, particularly for latent variables.

Our findings revealed a moderate coefficient of determination ($R^2 = 0.618$) for citizens' behavioral intentions, signifying that this intrinsic latent construct can be explained up to 61.8% by our model. As illustrated in Figure 2, our model elucidated 34% of the variance in ascription of responsibility, 32% in the personal norm, 5.9% in perceived behavioral control, 5.7% in the subjective norm, and 13.9% in attitude.

It is worth noting that predicting human behavior poses unique challenges compared to forecasting physical processes. As a norm, studies aiming to predict human behavior typically yield R^2 values below 50%. These values encapsulate actual effects and may not encompass additional factors that merit further investigation (Alotaibi & Mukred, 2022).

The structural model assessment encompassed hypothesis testing, as demonstrated in Figure 2, where standardized path coefficients delineated the interrelationships between exogenous and endogenous constructs. Detailed results were elaborated in Table 3.

In processing our data, we employed a bootstrapping methodology with 5,000 subsamples to gauge their significance, adhering to the approach outlined by Hair et al. in 2017. Given our hypothesis proposing a positive relationship, we conducted bootstrapping with a significance threshold of 0.05 using a one-tailed type. For our positive influence hypothesis, we set the criterion that the T-Value representing the independent variable's effect on the dependent variable must surpass ≥ 1.645 to establish significance.

Table 3. Result of hypothesis testing.

Paths	**Coefficient**	**t Value**	**Result**
H1: AT → BI	0.037	0.541	*Rejected*
H2: SN → BI	0.008	0.154	*Rejected*
H3: PBC → BI	0.421	6.729	Accepted
H4: EC → AT	0.373	4.297	Accepted
H5: EC → SN	0.240	3.541	Accepted
H6: EC → PBC	0.242	3.035	Accepted
H7: PN → BI	0.434	5.393	Accepted
H8: AC → PN	0.382	4.916	Accepted
H9: AR → PN	0.250	3.306	Accepted
H10: AC → AR	0.583	7.569	Accepted

Notes: t-values were computed through the bootstrapping procedure with 300 cases and 5000 samples. *p < 0.001

As seen in Figure 3 and Table 3, the bootstrapping procedure revealed eight significant and two rejected paths. It turns out that the citizens' behavioral intentions mainly depend on two variables: perceived behavioral control and personal norm. Furthermore, the structural equation models confirmed the above hypothesis proposed in Section 2. *First*, perceived behavioral control significantly influences citizens' intention to purchase electric cars. *Second*, environmental concern positively influences the citizens' attitudes, subjective norms, and perceived behavioral control toward the intention to purchase electric cars. *Third*, awareness of consequences and ascription responsibility positively influence citizens' norms toward pro-environmental behavior. *Fourth*, personal norm positively influences citizens' behavioral intention to purchase electric cars.

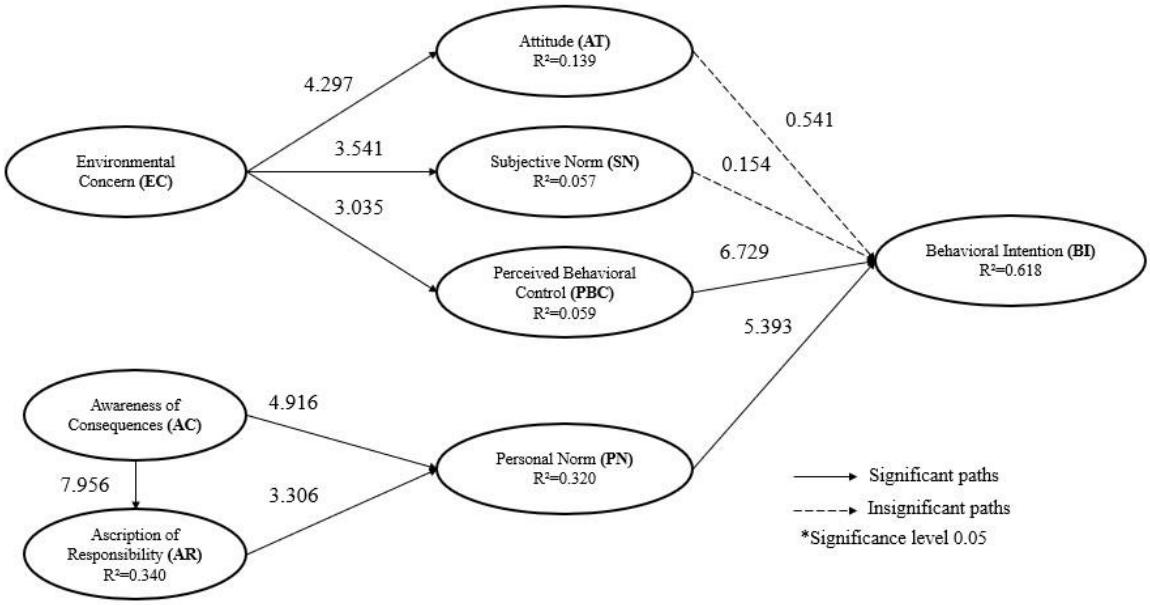

Figure 3. Study structural model (Result of path analysis)

Discussion

Upon confirming the direct effects of each factor on the behavioral intention to purchase electric cars, we proceeded to assess the validity of the indirect relationships between environmental concern, awareness of consequences, and ascription of responsibility to behavioral intention.

Specifically, our analysis sought to determine whether the environmental concern variable influenced behavioral intention through the mediating factors of attitude, subjective norm, and perceived behavioral control. Additionally, we examined whether awareness of consequences and ascription of responsibility impacted behavioral intention through their influence on the personal norm.

Our findings, as presented in Table 4, highlight several significant indirect effects. First, the path coefficient from environmental concern to perceived behavioral control is notable (coefficient = 0.102, t Value = 2.661, $p < 0.001$). This suggests that environmental concerns indirectly influence the behavioral intention to purchase electric cars through perceived behavioral control.

Second, the relationship from awareness of consequences to the personal norm and subsequently to behavioral intention is substantial (coefficient = 0.108, t Value = 2.582, $p < 0.001$). This indicates that awareness of consequences indirectly shapes behavioral intention through the personal norm.

Similarly, the ascription of responsibility to the personal norm to behavioral intention exhibits significance (coefficient = 0.116, t-Value = 3.824, $p < 0.001$). This underscores the indirect influence of ascription of responsibility on behavioral intention through the personal norm.

Table 4. Decomposition of indirect effects.

Path	Coefficient	t Value	Result
EC → PBC → BI	0.102	2.661	Significant
AR → PN → BI	0.108	2.582	Significant
AC → PN→ BI	0.166	3.824	Significant
AC → AR → PN → BI	0.063	2.467	Significant
AC → AR → PN	0.145	3.138	Significant
EC → AT → BI	0.014	0.510	*Insignificant*
EC → SN → BI	0.002	0.138	*Insignificant*

Next, an intriguing finding emerges when considering the combined impact of environmental concern, ascription of responsibility, and the personal norm. The indirect path involving these factors significantly contributes to behavioral intention (coefficient = 0.063, t-Value = 2.467, $p < 0.001$). It is evident that environmental concern and ascription of responsibility collectively influence behavioral intention through their impact on the personal norm.

Additionally, the ascription of responsibility to the personal norm demonstrates its influence (coefficient = 0.145, t Value = 3.138, $p < 0.001$) on the personal norm, further highlighting its role in shaping behavioral intention.

However, it's noteworthy that not all indirect paths yielded significant results. The paths from environmental concern to attitude to behavioral intention (coefficient = 0.014, t Value = 0.510, $p < 0.001$) and from environmental concern to subjective norm to behavioral intention (coefficient = 0.002, t Value = 0.138, $p < 0.001$) were found to be insignificant.

To provide a comprehensive perspective, we computed the total indirect effect of environmental concern on behavioral intention (coefficient = 0.118, t Value = 2.460, $p < 0.001$), as displayed in Table 5. This total indirect effect is the summation of individual indirect effects. It reaffirms that environmental concern exerts a positive indirect impact on behavioral intention through perceived behavioral control.

In summary, our analysis underscores the intricate web of indirect influences in the context of behavioral intention to purchase electric cars. Environmental concern, awareness of consequences, and ascription of responsibility each play distinctive roles in shaping behavioral intention, highlighting the importance of these variables in understanding environmentally conscious decision-making.

Table 5. Decomposition of total indirect effects.

Path	Coefficient	t Value	Result
AC → BI	0.229	4.702	Significant
AC → PN	0.145	3.138	Significant
AR → BI	0.108	2.582	Significant
EC → BI	0.118	2.460	Significant

CONCLUSION

This research has undertaken a comprehensive investigation into the factors influencing citizens' behavioral intention to purchase electric cars in areas afflicted by severe pollution. Drawing upon the foundations of the Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM), this study has yielded several noteworthy findings.

First, the only TPB variable that directly affects citizens' intention to purchase electric cars in the context of pollution is perceived behavioral control. This outcome aligns with earlier research conducted by Zhao et al. (2019), which also found a positive relationship between perceived behavioral control and purchase behavior, particularly in the context of energy-saving appliances. The study suggests that individuals enhance their perceived control when well-informed about energy-saving appliances, subsequently influencing their purchase behavior.

Second, in contrast to the first point, attitude and subjective norms did not exhibit significant effects on the intention to purchase electric cars. This finding is consistent with a study by Zhang & Li (2020), which explored the intention of Chinese college students to use carsharing and found that attitude had no impact on behavioral intention. Furthermore, it highlights that in certain environmental studies, subjective norms may not influence behavioral intention due to the absence of a governance system (Huang et al., 2021) and limited awareness of environmental consequences and benefits (Swetha et al., 2022). This underscores the need for heightened societal awareness to bolster the positive influence of subjective norms on intention.

Third, Environmental concern emerges as a significant factor positively impacting the elements of TPB and indirectly affecting behavioral intention through perceived behavioral control. This finding resonates with prior research by Zhang & Li (2020) and Borusiak et al. (2021), which also endorsed the notion that environmental concern plays a role in an individual's perceived behavioral control. It underscores that when individuals are provided with resources and confront obstacles, such as heightened awareness about the environment that evokes concern, their perceived behavioral control is affected.

Fourth, Personal norm is found to exert a direct influence on behavioral intention within the NAM framework. Conversely, awareness of consequences and ascription of responsibility indirectly influence the intention to purchase electric cars. This aligns with the findings of Zhao et al. (2019), emphasizing the direct impact of personal norms and the pivotal role of moral obligations in environmental conservation. It underscores the importance of a comprehensive understanding of green products, including the intention to purchase eco-friendly products.

Fifth, the relationship between awareness of consequences and personal norm is substantiated by a study by Rosenthal & Ho (2020). They argued that a high level of awareness of consequences can challenge an individual's values and foster a sense of unfulfilled moral obligation, which is intricately tied to the formation of personal norms. Furthermore, the connection between ascription of responsibility and personal norm is supported by Zhao et al. (2019), who posited that enhancing ascription of responsibility, often facilitated through environmental knowledge dissemination via green advertisements, can promote personal norms. Additionally, this study underscores that awareness of consequences positively influences the ascription of responsibility, a notion supported by Govaerts & Olsen (2022), which highlights the pivotal role of awareness of consequences in fostering a higher sense of responsibility ascribed to individuals.

Finally, upon a closer examination of Means and Standard Deviations shown in Appendix 1, it becomes evident that certain constructs, including Planned Behavioral Control (PBC), Subjective Norms (SN), Personal Norms (PN), and Behavioral Intentions (BI), exhibit lower means and larger standard deviations. This intriguing pattern is in contrast with constructs tied to values, such as Environmental Concern (EC), Awareness of Consequences (AC), Ascription of Responsibility (AR), and Attitude (AT), which display higher mean values and comparatively narrower response distributions. These disparities warrant further exploration. They suggest the possibility that the act of purchasing electric vehicles may not yet be strongly correlated with pro-environmental attitudes. This observation underscores the necessity for a comprehensive discussion to unravel the intricate relationships between attitudes, intentions, and actions in the context of pro-environmental behavior.

In conclusion, this research enriches our understanding of the multifaceted determinants impacting citizens' intentions to purchase electric cars in polluted areas. It sheds light on the intricate interplay between variables from both TPB and NAM frameworks, emphasizing the significance of environmental concern, personal norms, and the awareness of consequences and ascription of responsibility in shaping environmentally conscious decision-making.

Limitation

This study has three important limitations, as follows. First, the sample is relatively concentrated from the five population centers on Java Island. Thus, the result of this study might not be generalized to other Islands or the entire nation of Indonesia. Furthermore, the respondents in this study are still dominated by a specific age group, 42 to 57 years old. This domination makes generalizing the results to younger populations not recommended.

Second, several indicators have outer loading values of less than 0.7. Although the Value acquired is still sufficient to proceed with the research, it would be preferable if all indicators met the

minimal value criterion. A low outer loading value suggests that these indicators do not fully explain the construct variables researched.

Third, it is uncertain whether the respondents have the same perception or knowledge of electric cars, especially in terms of price and accessibility, which can affect the responses. Even though the price of electric cars has been presented as a uniform primer in the questionnaire, it cannot be guaranteed that every respondent read and referred to the passage to the same degree.

Finally, this study does not cover all the factors influencing one's intention to buy an electric car. There are many more external factors that are not included. In this study, the researcher focused on the citizens' concerns and awareness of the environment.

Suggestion

Based on the findings, this study obtained results that can provide insights to business practitioners or policymakers. Firstly, perceived behavioral control was found to influence behavioral intention significantly. In order to strengthen the perceived behavioral control or the feeling of the capability to purchase electric cars, electric cars must be made affordable and convenient for the public to purchase and use. Our findings suggest that the price range of affordable electric cars to the general public is between 150 million Rupiahs and 250 million Rupiahs (between 14,000 and 24,000 AUD). Currently, electric cars are seen as luxury goods with a price range above 400 million Rupiahs. It is also important to reduce difficulties and improve convenience in electric cars by providing sufficient charging stations in strategic places. That way, people will be more confident in buying and using electric cars.

Secondly, as electric cars are still seen as luxury goods, it is recommended for future research to add cost factors. Policies to promote electric vehicle deployment have been implemented in other countries such as China, Canada, India, and Japan. The regulations applied also vary, ranging from provisions for subsidies, and incentives, to tax exemptions. These policies contribute to the cost factor and can also be examined as a separate factor as the effect of monetary and non-monetary policies incentives.

Third, to improve the effectiveness of environmental concerns on attitude and subjective norms, managers and the government can improve through environmental socialization, communication programs, and media advertisements. Thirdly, since awareness of consequences was found to strongly influence the ascription of responsibility and personal norms, carrying out activities that increase public awareness of the environmental consequences is recommended if preventive steps are not to be taken. Lastly, personal norms, or moral obligations, will be more easily influenced if someone is exposed to prosocial and pro-environmental values from an early age. This finding means that managers and governments can try to educate citizens and young students about environmental protection, even though it may take years to see the results.

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APPENDIX 1. DESCRIPTIVE STATISTICS OF THE CONSTRUCTS.

	Items	Mean	SD
EC	EC1	6.06	1.04
	EC2	6.13	1.19
	EC3	5.43	1.42
	EC4	5.91	1.23
AC	AC1	5.96	1.20
	AC2	5.98	1.21
	AC3	6.35	0.99
	AC4	6.01	1.04
AR	AR1	5.89	1.11
	AR2	6.04	0.96
	AR3	5.86	1.21
	AR4	6.14	1.21
AT	AT1	5.78	1.23
	AT2	5.62	1.32
	AT3	5.33	1.51
	AT4	5.66	1.34
SN	SN1	3.92	1.54
	SN2	4.03	1.62
	SN3	3.30	1.63
	SN4	3.77	1.69
PBC	PBC1	3.97	1.78
	PBC2	4.07	1.71
	PBC3	5.45	1.58
	PBC4	4.22	1.72
	PBC5	4.35	1.67
PN	PN1	4.88	1.51
	PN2	3.61	1.63
	PN3	4.05	1.69
	PN4	4.91	1.54
BI	BI1	4.72	1.63
	BI2	4.51	1.62
	BI3	4.54	1.57
	BI4	4.48	1.56