“The impact of cultural values on the electric vehicle purchase intention: Testing the moderating role of subjective norms”

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THE IMPACT OF CULTURAL VALUES ON THE ELECTRIC VEHICLE PURCHASE INTENTION: TESTING THE MODERATING ROLE OF SUBJECTIVE NORMS

Abstract

Electric vehicles are widely considered an environmentally-friendly alternative to conventional vehicles, which contribute to mitigating air pollution and energy consumption. This research is conducted to investigate the impact of cultural values on the electric vehicle purchase intention, as well as testing the moderating role of subjective norms in the influence of both attitude towards electric vehicles and perceived behavioral control on the electric vehicle purchase intention. Using the theory of planned behavior as the theoretical framework, this study collects the data from 394 Vietnamese millennials through a convenience sampling survey. The results from this research indicate that cultural values, including man-nature orientation, collectivism, and long-term orientation positively influence the theory of planned behavior's factors, which are attitude towards electric vehicles, subjective norms, and perceived behavioral control. Then, three factors in the theory of planned behavior have a positive effect on the electric vehicle purchase intention. Additionally, it is found that subjective norms positively moderate the effect of both attitude towards electric vehicles and perceived behavioral control on the electric vehicle purchase intention. The results from this study contribute to the theory of planned behavior by integrating cultural values and give useful insights for policymakers and marketers in Vietnam to conduct relevant strategies that can enhance electric vehicle adoption.

Keywords theory of planned behavior, purchase intention, electric vehicles, millennials, Vietnam, culture

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INTRODUCTION

Numerous nations have launched policies fostering environmentally-friendly vehicles like electric vehicles for a more sustainable future (Birdsey et al., 2018). However, the sales of electric vehicles globally are substantially lower than that of conventional ones, as shown through their annual market shares, with only 8% in the U.S (VnEconomy, 2024), 2% in Malaysia and 5% in China (Tran et al., 2024). The low sales of electric vehicles worldwide indicate limited knowledge about consumer's green purchase behavior, which can be attributed to the insufficient foundation for green purchasing studies.

In Vietnam – a Southeast Asian country, the significant economic growth rate in the last two decades of around 7.18% has given rise to environmental issues (Dat & Truong, 2020). According to an annual survey conducted by IQAir in March, 2024, Vietnam was ranked 22nd among countries having the worst air quality globally, in which Hanoi – the capital of Vietnam – was ranked the 8th most polluted city in the world (Tran et al., 2024). As confirmed by the Institute of Occupational Health and Environment, 70% of total fine dust and air emission comes from transportation.

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Given the serious air pollution resulting from transportation, the Vietnamese government has issued favorable policies to foster the transition from conventional to electric vehicles (EVs) (Duc et al., 2022). However, by the end of 2023, the Ministry of Transportation reported that Vietnam had nearly 75 million registered motorbikes, in which there were only 2 million electric motorbikes that account for around 2.67% of the total. Hence, it is crucial to incorporate other factors into the theory of planned behavior to thoroughly understand consumer's intention to purchase electric vehicles, creating significant transportation movement that contributes to achieving the government's target of reaching zero net emissions by 2050 (Tran et al., 2024).

1. LITERATURE REVIEW AND HYPOTHESES

Extant literature has revealed some notable gaps that warrant more examination. Prior studies indicate a need for further investigation of how cultural values influence purchase intention across specific green product categories. Particularly, Nguyen et al. (2017) in Vietnam examined green electric appliances while Sreen et al. (2018) in India examined general green products. Additionally, demographic factors such as gender, income, and education are mainly employed as moderators. However, the moderating role of subjective norms in green studies is barely investigated, while it may have intricate mechanism besides its direct effect as proposed by the original theory of planned behavior in the process of forming behavioral intention (Wan et al., 2017).

This study adopts the theory of planned behavior (TPB) as the theoretical framework. According to Ajzen (1991), an individual's behavioral intention is formed by three factors: attitudes towards behavior (ATT), subjective norms (SN), and perceived behavioral control (PBC). It is one of the most important theories in social psychology for predicting human behavior as it has the ability to investigate the impact of personal, as well as social factors on consumer's intention (Yuriev et al., 2020).

However, the theory of planned behavior may require extension to fully capture green purchase motivations in specific cultural contexts like Vietnam. Prior research suggests that incorporating additional factors can improve TPB's explanatory power in different countries, and cultural values in particular may play a critical role (Shimul et al., 2021). Therefore, this study extends the theory of planned behavior by integrating three cultural values – collectivism, long-term orientation from Hofstede's (2001) dimensions, and man-nature orientation from the model of Kluchhohn and Strodtbeck (1961) – and by examining subjective norm as a moderator. These factors are expected to influence habitual pro-environmental decision-making and thus should enhance the model's ability to explain Vietnamese consumers' intention to purchase electric vehicles.

Man-nature orientation has gained increasing attention in sustainable studies. It is a core value shaping people's perspective towards nature and their commitment to environmental well-being (Bourdeau, 2004). In a society with low degree of man-nature orientation, people hold strong belief about their ability to dominate the nature. On the contrary, individuals living in a society with high degree of man-nature orientation live in harmony with nature (Jandt, 2004). Hence, people living in high man-nature oriented societies are more likely to exhibit positive attitude for green products (Sreen et al., 2018). Previous studies have adopted this cultural value to determine its impact on pro-environmental buying behavior and confirmed its positive impact on attitude towards green products (Sreen et al., 2018; Nguyen et al., 2022).

Collectivism is a prominent cultural value explaining consumer's behavior. It refers to a cultural orientation where individuals form strong group bonds and prioritize group benefits over personal interests (Sharma, 2010). Collectivists tend to exhibit a positive attitude with eco-friendly behavior for the society's well-being (McCarty & Shrum, 1994). Collectivistic consumers tend to be more confident in performing pro-environmental behaviors when supported by their groups (Hofstede, 2001). They are more likely to internalize and be influenced by their group's opinions, implying a strong subjective norm in favor of behaviors seen

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as beneficial to the community. In a collectivistic community, people tend to act in a way that brings benefits to the whole society, even when it causes inconvenience to them (Sreen et al., 2018).

Long-term orientation is considered a value having significant impact on the way individuals evaluate and plan for their purchase decisions. It is characterized by a focus on hard work and preparation for the future (Hofstede, 2001). As a result, environmentally-friendly products tend to receive positive attitude from people with long-term orientation as they are considered to bring beneficial values for the future and promote prosperity for the society (Leonidou, et al., 2010). While prior studies find that long-term oriented individuals hold more positive green attitudes, Sreen et al. (2018) reported a weaker relationship, suggesting context may play a role. There is high chance of individuals with long-term orientation having the tradition to maintain their relationships, thus preventing social conflicts by exchanging their intention with their groups before making decisions (Bearden et al., 2006). This leads to high subjective norms that guide their behavior. Long-term oriented individuals have solid belief that sustainable development can satisfy the present needs without sacrificing that of the future generations (Sreen et al., 2018). Since long-term oriented people are hard-working and patient, they tend to invest more resources and effort to gear towards favorable actions for the future, such as purchasing green products (Nguyen et al., 2017).

Attitude towards electric vehicles exerts profound influence on the way consumers make decisions to buy electric vehicles. It reflects the degree that an individual expresses their inner feelings or favors a green product (Zaremohzzabieh et al., 2021). That is, when consumers have more positive attitude towards green products, they will have stronger intention to buy them (Sun & Wang, 2019). When investigating the factors affecting the purchase intention for electric motorbikes in Vietnam, it is concluded that consumer's attitudes towards electric motorbikes have positive influence on their purchase intention for these products (Tran et al., 2024).

Perceived behavioral control exhibits the way an individual evaluates the degree of ease or difficulty of conducting a behavior, influencing the extent of the intention formation. It is argued that some external factors like time, skills and knowledge may hinder an individual's ability to purchase green products (Sun & Wang, 2019). When people are confident that they can obtain enough resources and face less difficulties, their perceived behavioral control will be improved, leading to stronger intention to buy green products. Similarly, there is higher chance that an individual is willing to buy green products if they have the ability to exert control over the external factors (Wang et al., 2018). Kautish et al. (2019) have come up with the conclusion about the positive relationship between perceived behavioral control and the green purchase intention, in which perceived behavioral control is considered a strong determinant of green purchase intention.

Subjective norm is an important factor in consumer research, especially in the context where individuals are greatly influenced by society. In a collectivistic country like Vietnam, social approval can heavily affect purchase decisions, as suggested by the study of Nguyen et al. (2017). They tend to follow the behavior or belief of their significant people as they are afraid of social pressure or their groups have the ability to give them appropriate advice and information (Park & Ha, 2012). For example, when comparing the green purchase intention between Chinese and Korean consumers, it is confirmed that the green purchase intention of consumers in China is strongly influenced by their own community, such as family, friends, or colleagues (Lee, 2017). Similarly, the study on electric vehicles in India by Deka et al. (2023) also concluded the significantly positive influence of subjective norms on the intention to adopt electric vehicles.

In addition to the direct effect in the theory of planned behavior, subjective norm is suggested to play a moderating role in this theory. A favorable subjective norm is suggested to enhance the predictive power of attitude towards intention (Povey et al., 2000). People affected by their significant others tend to adjust their attitude towards a certain behavior in accordance with their subjective norms (Sparks & Shepherd, 1992). The study conducted by Lee et al. (2018) on Korean millennials also concludes the positive impact of social norm on the correlation between attitude and luxury purchase intention.

Subjective norm also has a moderating effect on the relationship between perceived behavioral control and the electric vehicle purchase intention. The study conducted by Al-Swidi et al. (2014) on organic food concluded that when the subjective norm is favorable for the conduct of the behavior, perceived behavioral control can better predict purchase intention. In contrast, Wan et al. (2017) suggests that when receiving higher support from reference groups, the predictive ability of an individual's perceived behavioral control towards behavioral intention will become weaker. In the field of healthy eating, the research by Povey et al. (2000) yielded the result that the relationship between perceived behavioral control and intention is negatively moderated by subjective norms. Overall, subjective norms are expected to play a moderating role in the influence of perceived behavioral control on intention, though prior studies have reported conflicting directions for this effect.

Generally, prior papers suggest that the cultural values including man-nature orientation, collectivism, and long-term orientation exert positive influence on the theory of planned behavior's components (attitude towards electric vehicles, subjective norms, and perceived behavioral control). Then, these factors positively affect the electric vehicle purchase intention. In addition, subjective norm is proposed to increase the impact of attitude and significantly affect that of perceived behavioral control on the electric vehicle purchase intention.

Based on the existing literature, this study is conducted with the main purpose of investigating factors having influence on the electric vehicle purchase intention. Besides, it aims at examining the moderating role of subjective norms in the impact of both attitude towards electric vehicles and perceived behavioral control on the electric vehicle purchase intention.

Based on these insights, the following hypotheses are proposed:

H1: Man-nature orientation has a positive impact on the attitude towards electric vehicles.

H2a: Collectivism has a positive impact on the attitude towards electric vehicles.

H2b: Collectivism has a positive impact on the subjective norms for electric vehicles.

H2c: Collectivism has a positive impact on the perceived behavioral control for electric vehicles.

H3a: Long-term orientation has a positive impact on the attitude towards electric vehicles.

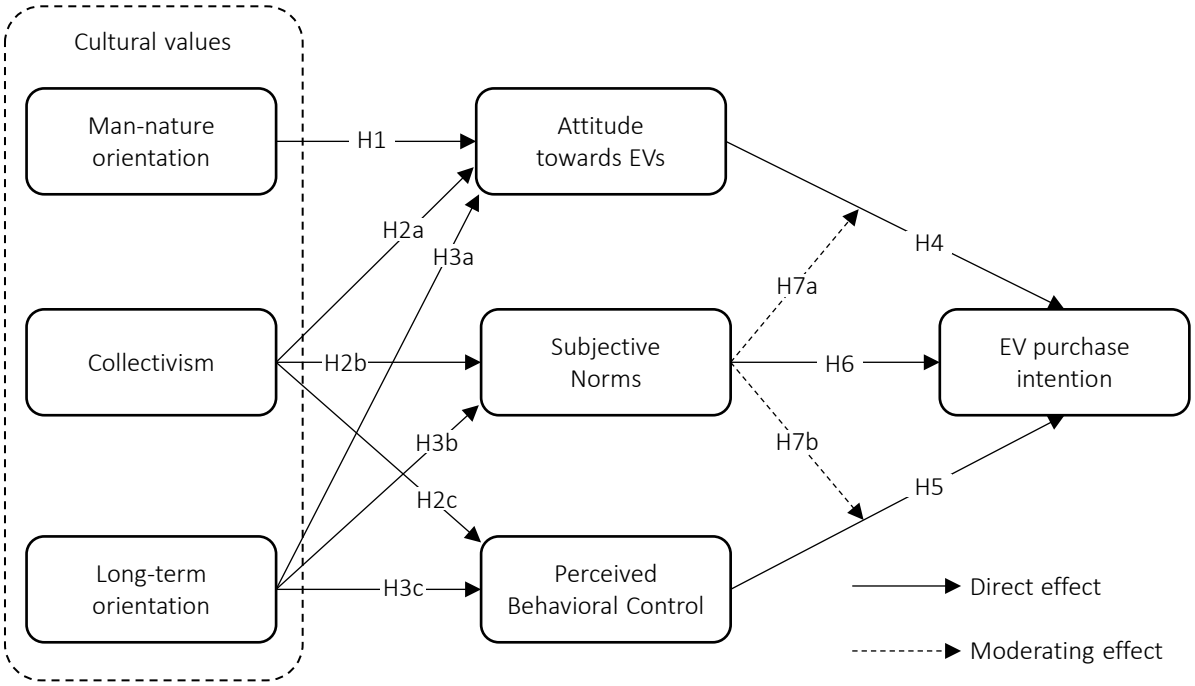

Figure 1. Conceptual model

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H3b: Long-term orientation has a positive impact on the subjective norms for electric vehicles.

H3c: Long-term orientation has a positive impact on the perceived behavioral control for electric vehicles.

H4: Attitude towards electric vehicles has a positive impact on the electric vehicle purchase intention.

H5: Perceived behavioral control has a positive impact on the electric vehicle purchase intention.

H6: Subjective norms have a positive impact on the electric vehicle purchase intention.

H7a: Subjective norms positively moderate the impact of attitude on the electric vehicle purchase intention.

H7b: Subjective norms significantly moderate the impact of perceived behavioral control on the electric vehicle purchase intention.

According to the proposed hypotheses, the conceptual model is illustrated in Figure 1.

2. METHODOLOGY

A pilot study involving 20 respondents was first conducted to ensure questionnaire clarity and appropriateness. After receiving the respondents' feedbacks and revising, the final questionnaire was created on Google Forms. Next, it was distributed on groups that share information about electric vehicles in Vietnam on social media, such as Facebook and Zalo. It took one month from January 2025 to February 2025 to gather the final sample consisting of 394 respondents by the convenience sampling method. The questionnaire survey was divided into four distinct parts, beginning with an introduction about the study and the confidentiality assurance for the participant's responses. Then, it moved on to the screening question to select millennials respondents. The third part included questions for the respondent's personal information. Lastly, it navigated participants to the section of questions related to the examined factors in the research.

This research concentrates on Vietnamese millennials or Generation Y who were born between 1981 and 1996 for the following reasons. Millennials, who account for around 35% of Vietnam's population, are the key consumers of many sustainable brands in Vietnam due to their sensitivity to new technologies and robust spending power (VietnamNet, 2019). According to a report made by Nielsen (2016), 73% of Vietnamese millennials are willing to spend more for sustainable products, which far exceed the percentage of 51% among baby boomers. Hence, the automobile industry can be profoundly affected by this group since it is predicted that the majority those adopting electric vehicles in the future will be millennials (Carzone, 2020). For the above reasons, they are relevant participants who have sufficient knowledge to answer questions for the study about the intention to purchase electric vehicle – a product that encompasses both advanced technology and environmental concern.

After running the analysis for descriptive statistics on SPSS 27, the description for demographic characteristics is summarized in Table 1. Specifically, the age group of 29-33 accounts for the majority with 43.1%. The ratio of male and female is quite balanced, most of whom has graduated from universities (55.1%). The majority of participants in this study earns from 10 million to 20 million VND per month (51.8%) and more than half of those (58.6%) are married.

The measurement scales for all variables in this research are measured by a 5-point Likert scale, in which 1 indicates "strongly disagree", 2 is for "disagree", 3 is for "neither disagree nor agree", 4 is for "agree", and 5 is for "strongly agree". They are adapted from prior studies and adjusted for the context of Vietnamese consumers. Mannature orientation is measured with three items adapted from the study of Sreen et al. (2018). The collectivism measures are also adapted from the scale by Sreen et al. (2018), in which it examines five dimensions. Long-term orientation is measured with four items from the scale developed by Nguyen et al. (2017). Attitude towards electric vehicles is measured by three items adopted from the scale of Sreen et al. (2018). Subjective norm is measured by four items from the scale developed by Tran et al. (2024). Perceived behavioral control

is measured using four items developed by Tran et al. (2024). Lastly, electric vehicle purchase intention is measured with three items adapted from the scale of Huang and Ge (2019).

Table 1. Demographic characteristics

Factor	Item	Frequency	Percentage (%)
Age	29-33	170	43.1
	34-38	135	34.3
	39-44	89	22.6
Gender	Male	218	55.3
	Female	176	44.7
Education	High school	21	5.3
	Intermediate	45	11.4
	College	101	25.6
	University	217	55.1
	Master	7	1.8
	Doctorate	3	0.8
Income (VND)	Under 5 million	15	3.8
	From 5 million – under 10 million	52	13.2
	From 10 million – 20 million	204	51.8
	Above 20 million	123	31.2
Marital status	Single	163	41.4
	Married	231	58.6

There are three main phases in the data analysis process using SmartPLS 3 software. Firstly, the preliminary analysis is conducted to remove items that cannot explain the variance within the construct. The second phase involves using Confirmatory Factor Analysis (CFA) to test the model fit, biases, reliability and validity. Finally, structural equation modeling (SEM) is employed to test the proposed hypotheses.

3. RESULTS

The outer loading scores for each construct are measured to evaluate the indicator reliability. A variable is considered reliable if its outer loading is equal or greater than 0.7. As indicated in Table 2, all outer loadings exceed 0.7, confirming sufficient indicator reliability.

Common Method Bias (CMB) is evaluated through Harman's single-factor analysis to check if a single factor accounts for the significant variance of the data. In this study, it is found that 24.365% of total variance, which is lower than the benchmark value of 0.5, is explained by a single factor, indicating the non-existence of common method bias.

A standardized root mean square residual (SRMR) of less than 0.08 indicates a good model fit. Hence, this model fits well with the data as the SRMR for the saturated model of 0.041 and estimated model of 0.043 are below the threshold of 0.08.

Table 2. Outer VIF and reliability results

Variable	Item	Outer VIF	Outer loading	Cronbach's Alpha	Composite reliability
Man-nature orientation (MNO)	MNO1	1.949	0.871	0.845	0.906
	MNO2	2.112	0.883		
	MNO3	2.023	0.866		
Collectivism (COL)	COL1	2.246	0.846	0.894	0.922
	COL2	2.110	0.827		
	COL3	2.258	0.834		
	COL4	2.388	0.852		
	COL5	2.098	0.828		
Long-term orientation (LTO)	LTO1	2.125	0.838	0.885	0.920
	LTO2	2.268	0.855		
	LTO3	2.342	0.872		
	LTO4	2.413	0.882		
Attitude towards EVs (ATT)	ATT1	2.103	0.867	0.852	0.910
	ATT2	2.038	0.875		
	ATT3	2.154	0.893		
Subjective norms (SN)	SN1	2.214	0.848	0.892	0.925
	SN2	2.624	0.880		
	SN3	2.270	0.859		
	SN4	2.566	0.889		
Perceived behavioral control (PBC)	PBC1	2.114	0.847	0.874	0.914
	PBC2	2.176	0.859		
	PBC3	2.191	0.854		
	PBC4	2.101	0.849		
Electric vehicle purchase intention (EPI)	EPI1	2.747	0.916	0.904	0.940
	EPI2	2.988	0.918		
	EPI3	3.005	0.915		

A measurement scale is considered reliable if the Cronbach's Alpha of all items are larger than 0.7. In Table 2, the Cronbach's Alpha for each variable fluctuates around 0.8, indicating that the scale achieves good internal consistency.

Apart from Cronbach's Alpha, the model's reliability is tested through composite reliability (CR). Table 2 shows that the composite reliability of all constructs is greater than the suggested value of 0.7, thus confirming the internal consistency.

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Table 3. Validity results

Variable	ATT	COL	EPI	LTO	MNO	PBC	SN	AVE
ATT	0.878							0.772
COL	0.313	0.838						0.701
EPI	0.318	0.251	0.916					0.839
LTO	0.330	0.035	0.216	0.862				0.743
MNO	0.186	-0.049	0.056	0.086	0.873			0.763
PBC	0.180	0.304	0.310	0.187	0.017	0.852		0.726
SN	0.183	0.266	0.282	0.287	0.029	0.147	0.869	0.755

The convergent validity is assessed through the Average Variance Extracted (AVE) displayed in Table 3. Accordingly, the AVE of all items exceed the recommended criteria of 0.5, meaning that each factor can explain more than 50% of its variance. Hence, it is straightforward that this model achieves convergent validity.

Another validity test is discriminant validity shown through the Fornell-Larcker method shown in Table 3. There exists discriminant validity in the model as the square roots of AVE (the first value of each column) are greater than the correlation values between the latent variables.

This research checks the multicollinearity among the items of the variables through outer Variance Inflation Factor (VIF) shown in Table 2 and among the variables through inner VIF shown in Table 4. All values of outer VIF and inner VIF are less than 5, ensuring no multicollinearity in the model.

The structural model is estimated by bootstrapping analysis with results shown in Table 5 and Figure 2. All hypotheses are supported as their p-values are less than 0.01. Particularly, man-nature orientation has a significantly positive impact on attitude towards electric vehicles ($\beta = 0.175$, $p < 0.01$), thus supporting *H1*. Next, it is found that

Table 4. Inner VIF

Variable	ATT	COL	EPI	LTO	MNO	PBC	SN
ATT			1.065				
COL	1.004					1.001	1.001
EPI							
LTO	1.009					1.001	1.001
MNO	1.010						
PBC			1.062				
SN			1.050				

Table 5. Hypotheses testing results

Hypothesis	Paths	Original sample (O)	t-statistics	p-values	Conclusion
H1	MNO → ATT	0.175	4.069	0.000	Supported
H2a	COL → ATT	0.311	7.393	0.000	Supported
H2b	COL → SN	0.256	5.428	0.000	Supported
H2c	COL → PBC	0.297	6.546	0.000	Supported
H3a	LTO → ATT	0.304	7.162	0.000	Supported
H3b	LTO → SN	0.278	6.285	0.000	Supported
H3c	LTO → PBC	0.176	3.659	0.000	Supported
H4	ATT → EPI	0.244	5.725	0.000	Supported
H5	PBC → EPI	0.215	4.878	0.000	Supported
H6	SN → EPI	0.200	4.436	0.000	Supported
H7a	SN x ATT → EPI	0.137	3.405	0.001	Supported
H7b	SN x PBC → EPI	0.121	2.989	0.003	Supported

Note: MNO – man-nature orientation; COL – collectivism; LTO – long-term orientation; ATT – attitude towards electric vehicles; SN – subjective norms; PBC – perceived behavioral control; EPI – electric vehicle purchase intention.

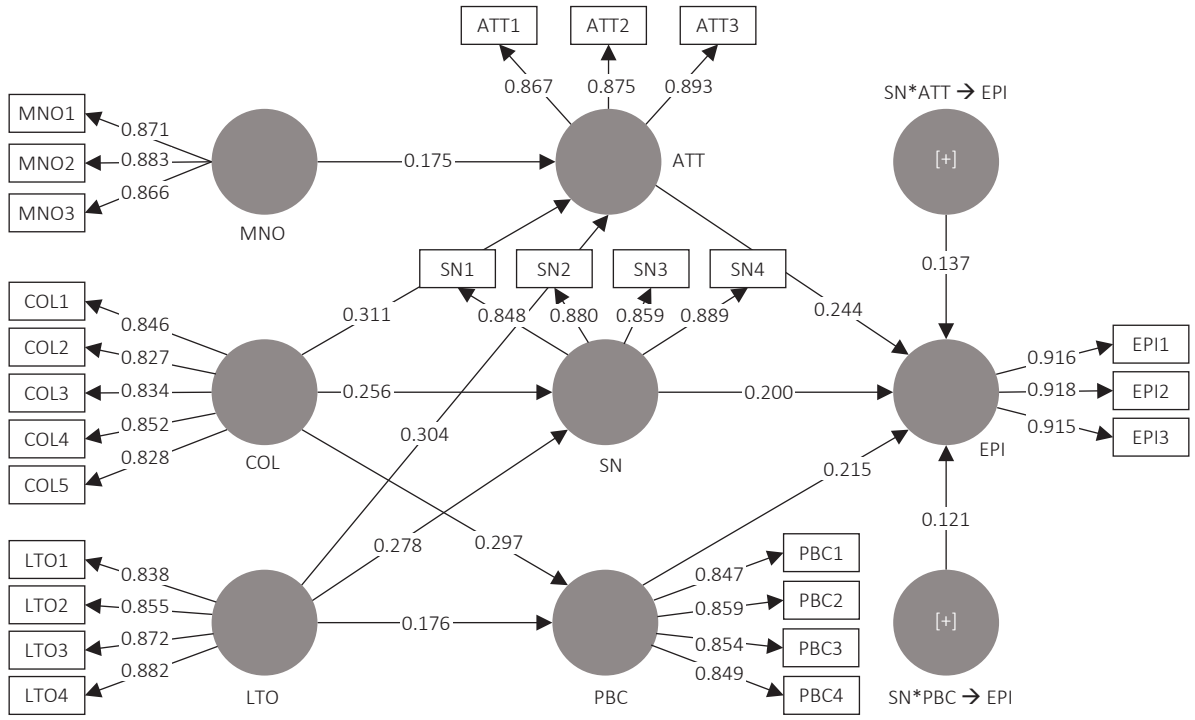

Figure 2. Final structural model

collectivism is significantly and positively related to attitude towards electric vehicles (β = 0.311, p < 0.01), subjective norms (β = 0.256, p < 0.01) and perceived behavioral control (β = 0.297, p < 0.01), thus supporting *H2a*, *H2b* and *H2c*. Besides, the results demonstrate that long-term orientation positively correlates with attitude towards electric vehicles (β = 0.304, p < 0.01), subjective norms (β = 0.278, p < 0.01) and perceived behavioral control (β = 0.176, p < 0.01), thus supporting *H3a*, *H3b* and *H3c*. Furthermore, as can be seen from Table 5, attitude towards electric vehicles (β = 0.244, p < 0.01), perceived behavioral control (β = 0.215, p < 0.01), and subjective norms (β = 0.200, p < 0.01)

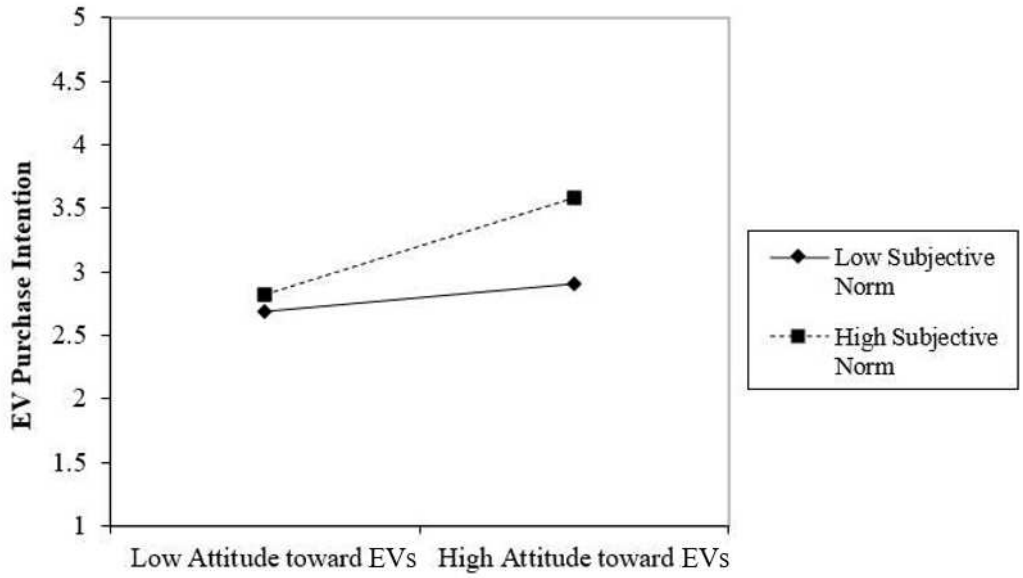

Figure 3. The moderating effect of subjective norms on the relationship between attitude towards electric vehicles and the electric vehicle purchase intention

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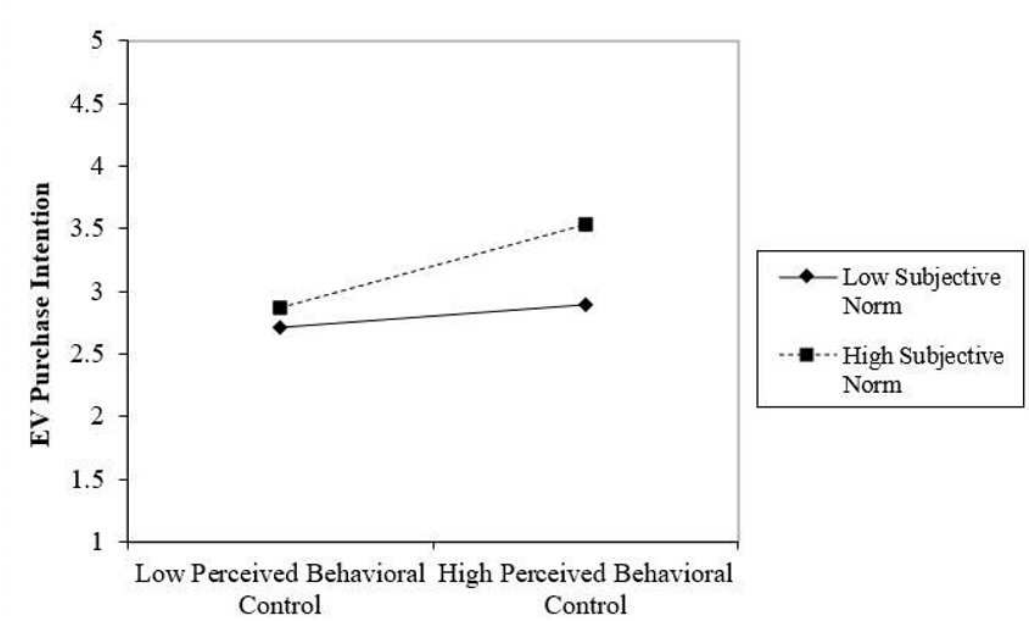

Figure 4. The moderating effect of subjective norms on the relationship between perceived behavioral control and the electric vehicle purchase intention

have significantly positive impact on the electric vehicle purchase intention, thus supporting *H4*, *H5*, and *H6*.

Regarding the moderating effect of subjective norms, it can be concluded that subjective norms positively moderate the impact of attitude towards electric vehicles ($\beta = 0.137$, $p < 0.01$) and perceived behavioral control ($\beta = 0.121$, $p < 0.01$) on the electric vehicle purchase intention, supporting *H7a* and *H7b*.

As visually displayed in Figure 3 and Figure 4, high subjective norm lines are steeper than that of low subjective norm. Therefore, it can be inferred that when the subjective norm is high, attitude towards electric vehicles and perceived behavioral control will have stronger impact on the electric vehicle purchase intention.

4. DISCUSSION

Firstly, this study supports *H1* that the path between man-nature orientation and attitude towards electric vehicles is positive, which is similar with the results from the studies of Sreen et al. (2018) and Nguyen et al. (2022). Hence, it can be inferred that those believing in the harmony between man and nature tend to have positive attitude towards electric vehicle in the theory of planned behavior framework, as electric vehicles are environmentally-friendly options that can mitigate pollution.

The next hypothesis *H2a* is supported, which is similar with the results of from the studies of Sreen et al. (2018) and Nguyen et al. (2017). This suggests that in the theory of planned behavior framework for electric vehicles, cultural value of collectivism influences intention by shaping attitudes. It can be interpreted that the collectivistic values in Vietnam cultivates positive attitude towards electric vehicles as electric vehicle is an environmentally-friendly option that contributes to the collective social well-being.

Next, this study supports *H2b* that collectivism has positive impact on the subjective norms in the theory of planned behavior framework, which reinforces the results of Sreen et al. (2018) and Nguyen et al. (2017). From this result, it can be interpreted that if a group of people living in a collectivistic society starts using electric vehicles, it can become a social norm that motivates people to follow.

Another supported hypothesis is *H2c*, which confirms the positive impact of collectivism on perceived behavioral control. This result adds to

the findings of Sreen et al. (2018) and Nguyen et al. (2017), which highlights the fact that when a collectivistic society has the goal of transitioning to electric vehicles to protect the environment, each individual in that society will face less difficulties in the electric vehicle adoption process as they can receive the support from their groups.

The fifth hypothesis *H3a* is supported, which confirms the significantly positive impact of long-term orientation on the attitude towards electric vehicles component of the TPB framework. This result is similar to that in the research of Nguyen et al. (2017) but contrary to the study of Sreen et al. (2018). A possible explanation for this result is that millennials, with high focus on long-term and sustainable values, increasingly have the tendency to show a positive attitude towards electric vehicles, as they are highly aware of the long-term benefits electric vehicles have on the environmental well-being.

The hypothesis *H3b* is supported, which found positive relationship between long-term orientation and subjective norms. This finding is aligned with the results from papers of Sreen et al. (2018) and Nguyen et al. (2022). Long-term orientation can create positive impact on the social norm of using electric vehicles as it fosters sustainable values, motivating people to seek social approval for environmentally-friendly technologies like electric vehicles.

In this study, long-term orientation imposes positive impact on perceived behavioral control, which is consistent with the results of Sreen et al. (2018) and Nguyen et al. (2017). This result implies that individuals having long-term perspectives tend to have the ability to evaluate and plan for sustainable options like electric vehicles.

Regarding the theory of planned behavior's components, attitude towards electric vehicles is confirmed to have positive influence on electric vehicle purchase intention in the theory of planned behavior model among Vietnamese millennials, which is consistent with the findings of Sreen et al. (2018), Nguyen et al. (2022) and Tran et al. (2024). This result also supports the theory of planned behavior framework, which proposes that attitude plays an essential role in the process of forming intention (Tran et al., 2024).

The next component having influence on the electric vehicle purchase intention is perceived behavioral control. This result adds to previous studies conducted by Sreen et al. (2018), Sun and Wang (2019). In the field of green marketing, the significant impact of perceived behavioral control on electric vehicle purchase intention is considered relevant as perceived behavioral control has been viewed as a good explanatory factor for consumers' intention to purchase green products (Baker et al., 2007).

Subjective norm in this study has positively significant influence on the electric vehicle purchase intention, which supports the outcomes produced by Nguyen et al. (2017), Tran et al. (2024), Sreen et al. (2018). It further confirms the fact that in a collectivistic society like Vietnam, people's purchase decisions are greatly shaped by social norms (Nguyen et al., 2017).

In terms of moderating effect, it is found that subjective norm positively moderates the relationship between attitude towards electric vehicles and the electric vehicle purchase intention. Similar results are also withdrawn from the studies of Povey et al. (2000) and Lee et al. (2018). It can be explained by the fact that Vietnamese millennials greatly depend on social approval to make decisions, leading to stronger influence of attitude on electric vehicle purchase intention when subjective norms are strong.

Lastly, *H7b* proposed a moderation of perceived behavioral control by subjective norms. This interaction term is positively significant, indicating that the subjective norms in the TPB framework noticeably alter the effect of perceived control on the electric vehicle purchase intention in the data. This result contradicts to that confirmed by the studies of Jain (2020) and Wan et al. (2017). It indicates that millennials in Vietnam have more confidence about their ability to adopt electric vehicles when receiving support from their reference groups.

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CONCLUSION

This study examines the influence of cultural values, including man-nature orientation, collectivism, and long-term orientation in the process of forming the electric vehicle purchase intention and views subjective norm as a moderator in the theory of planned behavior model for the domain of electric vehicles in Vietnam. This study significantly contributes to the extant literature by being the first paper to test the impact of cultural values and the moderating role of subjective norms in the theory of planned behavior framework for electric vehicle field. Unlike prior studies, it is found that subjective norms play surprising inhibitory moderating roles in the effect of both attitude and perceived behavioral control, which had not been demonstrated in green product contexts before. This research provides practical implications for policymakers and marketers in Vietnam to reduce adoption barriers by expanding charging infrastructure, offering financial incentives, conducting awareness campaigns, and providing direct electric vehicle experience to enhance consumer knowledge and confidence.

However, it is not without limitations, which can be broken down into four main points. To begin with, it merely focuses on the field of electric vehicle. Hence, future research can apply the proposed model in other green domains, such as green food and green apparel. Second, the exogenous factors in this research are confined to cultural values. To enhance the predictive power of the research model, future studies should add more exogenous variables, including cognitive factors and consumer individual characteristics. Thirdly, this study employs subjective norms as the only moderator in the theory of planned behavior. Therefore, future research can employ other factors such as consumer involvement as a moderator. Lastly, it would be meaningful to conduct a longitudinal study to investigate how the impact of cultural values on consumer's purchase intention can change over time.

AUTHOR CONTRIBUTIONS

Conceptualization: Phu Hoang Nguyen, Huong Thu Duong, Sinh Duc Hoang.
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APPENDIX A

Table A1. Measurement items

Construct	Item	Source
Man-nature orientation	People need to understand the impact of transportation on the environment and shift towards environmentally-friendly options like electric vehicles. (MNO1)	Sreen et al. (2018)
	Buying environmentally-friendly transportation options, like electric vehicles is a way for me to live in harmony with nature. (MNO2)	
	As part of the nature, human beings should have the responsibility to protect it by buying environmentally-friendly vehicles like electric vehicles. (MNO3)	
Collectivism	Even if my decision to buy electric vehicles is not supported, I still do so to contribute to the society's collective goal of protecting the environment. (COL1)	Sreen et al. (2018)
	I actively participate in discussions and actions that promote the purchase of electric vehicles, as part of collective efforts to reduce emissions. (COL2)	
	People should together promote electric vehicle purchase, even if they have different opinions on the benefits of electric vehicles. (COL3)	
	I want to buy environmentally-friendly vehicles like electric vehicles because the environmental well-being of society is important to me. (COL4)	
	I enjoy discussing and sharing information about electric vehicles with others. (COL5)	
Long-term orientation	I consider the long-term benefits and costs when deciding to purchase an electric vehicle. (LTO1)	Nguyen et al. (2017)
	I am working hard to have enough financial resources to purchase an electric vehicle in the future. (LTO2)	
	I do not mind postponing the spending for short-term pleasures to save for buying an electric vehicle. (LTO3)	
	Persistence is important for overcoming challenges in adopting electric vehicles. (LTO4)	
Attitude towards electric vehicles	I believe that electric vehicles help to reduce air pollution. (ATT1)	Sreen et al. (2018)
	I believe that electric vehicles help to save natural resources. (ATT2)	
	I prefer electric vehicles to gasoline-powered vehicles. (ATT3)	
Subjective norms	I am interested in electric vehicles because everyone around me also uses them. (SN1)	Tran et al. (2024)
	I am interested in electric vehicles because relatives, friends, and colleagues recommend that I buy electric vehicles. (SN2)	
	My decision to buy an electric vehicle may be influenced by advice and personal feelings on social networks. (SN3)	
	I am interested in electric vehicles because my favorite celebrity recommended buying them. (SN4)	
Perceived behavioral control	I am more interested in the brand of electric vehicles than other kinds of vehicles (PBC1)	Tran et al. (2024)
	Buying or not buying an electric vehicle is based on my decision. (PBC2)	
	I can afford an electric vehicle with my finances. (PBC3)	
	I think an electric vehicle is easy to use. (PBC4)	
Electric vehicle purchase intention	I look forward to more brands and models of electric vehicles to be introduced to the market. (EPI1)	Huang and Ge (2019)
	I will buy an electric vehicle in the future. (EPI2)	
	I recommend that others buy electric vehicles. (EPI3)	

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