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Driving the Future: What Motivates Electric Vehicle Adoption in Kathmandu Valley

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Abstract

Background: Electric vehicle (EV) adoption is accelerating globally due to environmental and economic concerns. Understanding consumer purchase intention in emerging markets, such as Kathmandu Valley, is crucial for effective market development. However, adoption remains low locally, partly due to infrastructure and behavioral barriers.

Purpose: The study aims to investigate the factors influencing consumers' purchase intention for electric cars in Kathmandu Valley, Nepal, with a focus on psychological, social, and control-related determinants.

Design/methodology/approach: An explanatory research design based on an extended Theory of Planned Behavior (TPB) framework was employed. Data were collected from 403 residents through structured questionnaires using online and offline convenience sampling. Structural Equation Modelling (SEM) with Partial Least Squares (PLS) was applied to test the relationships between Attitude, Emotion, Subjective Norm, Perceived Behavioral Control, and Purchase Intention.

Findings: Emotion, Subjective Norms, and Perceived Behavioral Control were found to have a significant positive effect on EV purchase intention, indicating that decisions are shaped by feelings, social pressures, and practical considerations of resources and infrastructure. Attitude, however, was not a significant predictor, suggesting that general positivity toward EVs alone does not translate into purchase intention. The main adoption barriers identified were insufficient charging infrastructure and technical/display issues, while key solutions included expanding charging stations, improving access to spare parts, and implementing supportive fiscal policies such as tax reductions and subsidies.

Conclusion EV adoption in Kathmandu Valley shows strong potential but is constrained by infrastructure and social-psychological factors. Successful promotion of electric mobility requires more than economic incentives, it depends on fostering positive emotional connections, leveraging social networks for influence, and establishing reliable, well-equipped support infrastructure to enhance consumers' perceived control and confidence in ownership. Addressing these factors can accelerate adoption and make EVs a viable and attractive alternative in the region.

Keywords: Electric Vehicles, Purchase Intention, Theory of Planned Behavior, Consumer Behavior, Adoption Barriers, Emerging Market

1. Introduction

In the present context, electric vehicles (EVs) are crucial to consider as a powerful tool for mitigating carbon footprint and enhancing air quality. They are important in the process of decarbonization because automobile emissions are directly proportional to the electricity generation mix; the cleaner the power grid, the cleaner the EVs (Montgomery, 2010). In contrast to internal combustion engine (ICE) cars, EVs have a significant decrease in soot and smog and thus, have positive effects on the overall health outcomes of the population, especially children, the elderly, and those with prior respiratory health issues. Although it is not clear that EVs possess environmental advantages, there is empirical evidence, which strongly argues in favor of EVs over conventional vehicles. EVs are already cleaner than gasoline-powered vehicles, which is verified by modeling studies carried out by the Electric Power Research Institute-Natural Resources Defense Council (EPRI-NRDC), as well as life-cycle analysis carried out by the Union of Concerned Scientists (UCS). EVs produce around half the amount of carbon dioxide that ICE vehicles produce (in a life cycle). This evaluation does not just consider the emission caused by electricity generation but also by emission caused in the manufacture of batteries (Andersen et al., 2009).

Notably, according to the UCS analysis, even EVs which use coal-dominant electricity systems are more efficient than traditional cars regarding the total emissions. With the introduction of renewable energy sources (like wind and solar power) into the electricity grids in increasing numbers, the environmental benefits of EVs will continue to gain further strength (Boloom, 2019). The markets of electric cars include the countries whose charging infrastructure is publicly accessible. Here, by the term public, it means that it is charging facilities that are freely accessible without any restriction. The vehicles that are fully battery-powered or plug-in hybrid electric vehicles are categorized as electric (Statista, 2022; Al-Buenain, 2021). Charging infrastructure is a serious factor that defines the uptake of EV and the growth of the market. The sales of EVs have recorded impressive growth in the last one decade globally. In 2012, the electric cars sold around the world were about 120,000; 2021 week by week, the number was being attained. In 2021, the global EV sales almost doubled annually, with 6.6 million vehicles being sold (Frieske et al., 2022), despite disruptions to its supply chain due to the COVID-19 pandemic and supply chain issues, such as a shortage of semiconductor chips.

This influx made the overall volume of electric cars on the street rise to more than 16.5 million, with battery electric vehicles (BEVs) taking about 70 percent of the rise. In 2021, 9 percent of worldwide automobile sales were EVs, which was four times higher than in 2019, and 100 percent of all net increases in worldwide cars sales (Wen et al., 2021). China and Europe are outlined as the key EV markets in the region, with both of them contributing more than 85 percent of the total electric car sales at the global level in 2021. China registered a figure of 3.3 million EVs, whereas Europe registered 2.3 million units. In the second place came the United States with sales of about 630,000, which is nearly twice the 2020 level (International Energy Agency, 2022). These tendencies highlight the fact that the EV market has become one of the most active industries in the clean energy sector (Marczinkowski et al., 2020). Interventions by policy have been important in hastening the adoption of EV. The governments of different countries have established high goals to achieve vehicle emissions between 2030 and 2050 and implemented enabling policies, like financial incentives, tax exemptions, and investments in infrastructure (Gryparis et al., 2020). As an example, in 2017, the US spent USD 5 billion on the development of EV infrastructure, and a number of countries provide subsidies by reducing registration fees and waiving import, purchase, and road taxes to promote the use of EVs (Kumar et al., 2021; Markets and Markets Research Private Ltd., 2022). Despite the existing challenges of increasing battery costs, decreased subsidies, and supply chain issues, the EV industry has been growing and is likely to take over several transportation segments in the future (Juliussen, 2022; Pelegov et al., 2022). Applying to Nepal, EVs are becoming an increasingly viable choice among the environmental conscious consumers as an alternative to fossil fuel powered transportation (Mehrotra et al., 2021). Although EVs can perform on a level with other types of vehicles, high initial prices, a lack of charging stations, and poor electricity availability are all major obstacles to its

usage. The Environment-Friendly Vehicle and Transport Policy (2014) of Nepal had a goal of penetrating 20 percent of the market with EVs by 2020, but due to the inconsistent taxation policies the growth of the market was hampered. It is important to note that the number of EV sold decreased in the 2020/21 budget because of the sudden rise of excise and customs rates, but this number recovered in 2021 as the customs levied was brought down to 10 percent and road and renewal fee levied on EVs were waived. The Nepal Electricity Authority (NEA) trying to put up about 50 charging stations across the country and provincial governments (e.g. the introduction of electric buses in Bagmati Province) are positive results in the development of sustainable transport (Pradhan, 2021). However, meaningful EV adoption in Nepal will only be achievable with the regular policy promotion, the spread of charging infrastructure, and the availability of electricity to coordinate national transport objectives with environmental sustainability objectives.

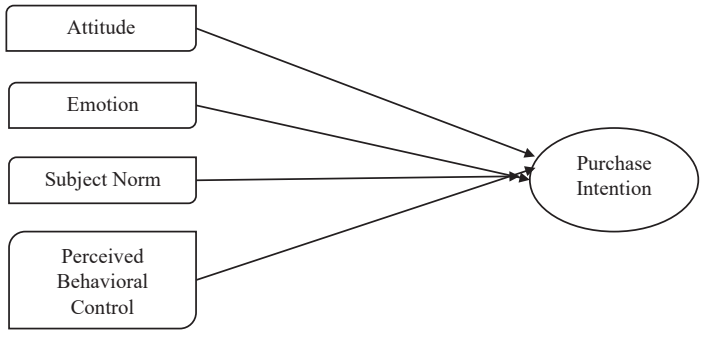
2. Literature Review

The Theory of Reasoned Action (TRA) asserts that an individual's behavior is primarily determined by behavioral intention, which in turn is influenced by the individual's attitude toward the behavior and subjective norms (Fishbein & Ajzen, 1975). Behavioral intention is considered the most immediate predictor of actual behavior, reflecting the individual's belief that performing a particular behavior will lead to desired outcomes. Building upon TRA, the Theory of Planned Behavior (TPB) extends the model by incorporating perceived behavioral control, thereby accounting for behaviors that are not entirely under volitional control (Ajzen, 1991). According to TPB, planned behaviors are shaped by behavioral intentions, which are jointly influenced by an individual's attitude toward the behavior, the subjective norms surrounding its performance, and the perceived ease or difficulty of performing the behavior. TPB has been widely applied in social science research to explain and predict human behavior, particularly in contexts involving decision-making and intention formation.

Rational Choice Theory assumes that individuals make decisions based on rational evaluations of available information, aiming to maximize personal benefits and satisfaction while aligning outcomes with their self-interest and personal objectives (Satz & Ferejohn, 1994). The theory suggests that individuals systematically compare costs and benefits before selecting the option that offers the greatest utility within existing constraints. The Theory of Consumption Value provides a marketing-oriented perspective on consumer decision-making by explaining consumption behavior through multiple value dimensions that motivate purchase or non-purchase decisions (Tanrikulu, 2021). This theory elucidates why consumers choose specific products, product categories, or brands over alternatives and is applicable across a wide range of goods and services. Similarly, Diffusion of Innovation Theory explains how new ideas, products, or technologies spread over time among members of a social system through various communication channels, including mass media and interpersonal networks (Rogers, 1983). The theory emphasizes the role of human capital, social influence, and communication in shaping adoption decisions and suggests that widespread adoption of innovations is essential for achieving development and sustainability. Considering the objectives of this study, the Theory of Planned Behavior is identified as the most appropriate theoretical foundation. TPB explicitly explains how behavioral intentions shaped by attitudes, subjective norms, and perceived behavioral control lead to actual behavior. Since this study aims to examine the determinants influencing the general public's purchase intention toward electric vehicles, TPB provides a robust and well-established framework for analyzing the causal relationships among these key psychological factors and purchase intention.

The concepts presented in a conceptual framework interlock with each other and it is the main gateway for setting hypothesis (Hardisty, 2019). Different models related to theory of planned behavior is revived. After in depth study model by Moons and Pelsmacker (2015) is modified to create a new framework.

Figure 1: Conceptual Framework



Source: Adopted from Moons and Pelsmacker (2015)

Attitude and Purchase Intention:

Attitude acts as an evaluation of intended behavior, based on individual beliefs and evaluations. Attitudes towards behavior reflect the degree to which this behavior is evaluated favorably or unfavorably (Fishbein and Ajzen, 1975; Moons and Pelsmacker, 2015). An individual who, for example, has positive attitudes towards innovation is likely to adopt new technologies (Rogers, 1995). As such, the first hypothesis of this study is:

H1: Attitude has a significant relationship on Purchase Intention of electric cars.

Emotions and Purchase Intention

No aspect of our mental life is more important to the quality and meaning of our existence than the emotions. They are what make life worth living and sometimes worth ending. So it is not surprising that most of the great classical philosophers had recognizable theories of emotions. These theories typically conceived of emotions as a subject's phenomenologically salient responses to significant events and as capable of triggering distinctive bodily changes and behaviors. It has been widely confirmed that emotion elicited by products, services, and store atmosphere positively impact subsequent consumer responses such as satisfaction (e.g., Hume and Mort 2010) and purchase intention (e.g., Kang et al. 2010). Prior studies have treated emotions as a multidimensional structure (i.e., joy and pleasure for positive emotion) or as several specific emotions at the same level (i.e., excitement). In studies measuring emotion with multiple dimensions, contents of emotions have been greatly divergent.

H2: Emotions have a significant relationship on Purchase Intention of electric cars.

Subjective Norm and Purchase Intention

A subjective norm is the perceived social pressure to engage in behavior (Ajzen, 1991; Fishbein & Ajzen, 1975). That is, the more an individual perceives certain behavior as being important to his friends, family or society, the greater the likelihood of forming intentions to engage in the behavior. In this sense, Simsekoglu and Nayum (2019) found that the subjective norm is positively related to the intention to buy BEV in Norway.

H3: Subject norm has a significant relationship on Purchase Intention of electric cars.

Perceived Behavioral Control and Purchase Intention:

Regarding TRA, TPB adds the "perceived behavioral control" factor, which can be defined as an individual's perception of his or her ease or difficulty in performing a certain behavior (Fishbein & Ajzen, 1975). The perceived behavioral control is affected by the perception of one's own abilities, but also by any constraints or facilitators in the context of the decision (Fishbein & Ajzen, 1975). From

H4: Perceived behavioral control has a significant relationship on Purchase Intention of electric cars.

Table 1: Observed Variables and Its Description

Variable	Variable Notable	Definition	Description
Attitude	ATT1	Good Attitude	Using an electric car is good attitude
	ATT2	Wise Attitude	Using an electric car is wise attitude
	ATT3	Favorable Attitude	Using an electric car is good attitude
	ATT4	Positive Attitude	Using an electric car is a positive attitude.
	ATT5	Environmental benefit	Beneficial to the environment in the long term
	ATT6	Electricity consumption	Decrease the use of petroleum
Emotion	EMO1	Enjoyment	Enjoy driving an electric car
	EMO2	Future drive	Looking forward to driving an electric car
	EMO3	Driving experience	Believe that driving an electric car will not frustrate
	EMO4	EV Brands	My friends and parents about products and brands regarding electric vehicle
	EMO5	Influence by friend	Should buy an electric vehicle influence by friend
	EMO6	Mass Media	Media urge me to use an electric vehicle
Subjective Norm	SBN1	Support	People Support if I drive electric vehicle
	SBN2	Convince	People Convince if I drive electric vehicle
	SBN3	Think	Important to think before driving electric vehicle
	SBN4	Knowledge	Enough knowledge to drive an electric car
	SBN5	Capable	Capable of driving an electric car.
	SBN6	Control	Easy to control the aspects that differentiate an electric car from a conventional car
Perceived Behavioral Control	PBC1	Price	Price of an electric vehicle is important
	PBC2	Service	Maintenance and repair of an electric vehicle is important
	PBC3	Location	Place where can buy Electric car
	PBC4	Budget	Budget is enough to buy an electric car
	PBC5	Cost saving	Reduction in monthly fuel costs
	PBC6	Recharge	Easy to recharge the electric car while away from home
Purchase Intention	PI1	Intend	Intend to drive an electric car in the near future.
	PI2	Recommend	Recommend using the electric car to other people
	PI3	Better quality	Quality is better than a conventional vehicle.
	PI4	Consideration	Consider buying an environmentally-friendly electric vehicle.
	PI5	Future car	Buy an electric car in the near future
	PI6	Expensive	Electric car even if it is more expensive as compared to a conventional car.

3. Research Methods

This study employs an explanatory research design to investigate the factors influencing the purchase intention of electric vehicles (EVs) among the general public in Kathmandu Valley. Explanatory research is particularly suitable for examining causal relationships between variables and testing theoretical propositions in social science research (Shrestha et al., 2021). The population of interest included residents of Kathmandu Valley, which comprises the districts of Kathmandu, Lalitpur, and Bhaktapur. The valley is home to approximately 1.47 million people and represents a diverse socio-demographic profile relevant to this study (World Urbanization Prospect, 2018).

Study area and Population

The study area for this research is Kathmandu Valley in Nepal which consists of three districts Kathmandu, Lalitpur and Bhaktapur which is located in Province 3 known as Bagmati Province of Nepal (Shrestha et al., 2021). The geographic coordinates of Kathmandu valley are: latitudes 27°32‟13” and 27°49‟10” north and longitudes 85°11‟31” and 85°31‟38” east and is located at a mean elevation of about 1,300 meters (4,265) above sea level in the bowl-shaped and thus Kathmandu valley covers an area of 395 km^2 (Bhandari et al., 2021). Kathmandu Valley is located in the central part of the country as well as the capital city of Nepal with the population of around 1.47 million people (World Urbanization Prospect, 2018).

Sampling Technique

This study adopts a non-probability sampling technique to select respondents from the target population. Non-probability sampling is suitable for studies aiming to examine relationships among variables rather than achieve full population representativeness (Devkota et al., 2023). The research focuses on assessing the level of awareness and promotional exposure related to automobiles, particularly electric vehicles, in Kathmandu Valley. Given the absence of a complete sampling frame and practical constraints, this approach enables efficient data collection from relevant respondents. It thus supports meaningful analysis aligned with the study objectives.

To calculate the sample size for this study, we used the following formula: $n = z^2 pq/l^2$ (Neilson, 2011; Parajuli et al., 2023; Singh et al., 2024). Here, n_0 is the sample size for the study, the standard tabulated value for 5% level of significance (z) is 1.96, p is the prevalence of customer awareness on retail banking loan which is 50% and the allowable error to be tolerated (e) is 5%. Therefore, the final sample size for this study was 403.

Research Instruments, Data Collection and Analysis

A structured questionnaire administered through interviews was the primary research instrument used in this study. The questionnaire was specifically designed to collect quantitative data on the contribution of developmental sectors to ethnic communities residing in Lalitpur District. To ensure alignment with the study objectives, the questionnaire items were systematically developed and structured. Primary data were collected through interviews conducted among individuals from various ethnic groups living in Lalitpur District. Prior to the main survey, a pre-test was conducted to assess the clarity, reliability, and relevance of the questionnaire items. Following the pre-test, the finalized questionnaire was digitized and administered using the KoBo Toolbox platform for efficient data management.

Data collection was carried out using both online and offline modes. Online data were primarily gathered through digital platforms such as email and social media applications, including WhatsApp, Messenger, and Viber, while offline interviews complemented the online responses. The data collection process was conducted over a two-month period, from January 2023 to February 2023. Data was analyzed using descriptive and inference statistic using SmartPLS and MS Excel.

4. Results

Socio-Demographic Characteristics

Table 2: Socio Demographic Characteristics

Demographic Characteristics	Number	Percentage
Gender		
Male	360	89.33
Female	43	10.67
Age		
20-30	23	5.71
30-40	258	64.02
40-50	114	28.29
50 and Above	8	1.99
Marital Status		
Married	291	72.21
Unmarried	112	27.79
Divorced	0	0
Widow	0	0
Educational Level		
SEE/SLC	0	0
Intermediate	22	5.46
Bachelor	213	52.85
Master	156	38.71
Above Master	12	2.98
Profession		
Teaching	17	4.22
Private Job	173	42.93
Government Service	24	5.96
Business	152	4.22
NGO's	14	3.47
INGO's	8	1.99
Other, Please Specify	15	3.72
Monthly Income		
Below 50,000	54	13.4
50,000-1,00,000	204	50.62
1,00,000-2,00,000	125	31.02
2,00,000-5,00,000	20	4.96
5,00,000-10,00,000	0	0
10,00,000 and above	0	0
Family Types		
Nuclear	154	38.21
Joint	226	56.08
Extended	23	5.71

Source: Field survey (2023)

Out of 403 respondents included in this survey, 89.33% were male and 10.67% were female and 0% were others. In a similar study conducted by Huang and Ge (2019), female participation was 32.1% which indicated that this study has similar female participation as compared to previous study. This study also showed that in terms of age 5.71% respondent are from age group 20-30, 64.02% respondent are from age group 30-40, 28.29% respondents are from age group 40-50. In similar study by Afroz et al. (2013), majority of respondent is between ages of 30-40 which support the result of the study. In this study among the 403 respondent 72.21% respondent were married, 27.79% respondent were unmarried and 0% respondent were divorced and widow. The result of the survey shows majority of the respondent possess bachelor degree that is 52.85% followed by 38.71% possess Master's, 5.46% possess Intermediate, 2.98% possess above master's and only 0% are illiterate General Perspective on Electric Car. Most of the respondent's profession was related to private jobs (42.93%). Only 1.99% of the respondents were working at INGOs. It means most private jobs employees use electric car in Kathmandu valley. Furthermore, the majority of respondents were found to have earning within the range of 50.000-1, 00,000 i.e., 50.62%. It is also found that most of the car users are member of joint family i.e., 56.08%. Thus, it is found that married male youth working at private jobs with income of 50,000- 1,00,000 belonging to joint family are using vehicle.

General Perspective on Electric Cars

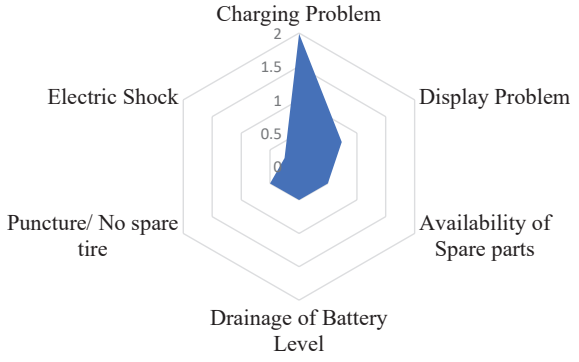
The General perspective described mainly deals with the information regarding purchase intention of electric car in Kathmandu Valley. Through the research, the result shows that only 4.47% of respondents owned the electric vehicles and 95.53% of respondents do not owned the electric car uses electric vehicle. Majority of the respondent 74.44% get electric vehicle knowledge from social media where lower number of respondents 4.22% get knowledge form other than friends and relative, newspaper, television, colleagues and seller. Several studies have found that there are a general knowledge and awareness about electric vehicles (Mehta, 2013). This study reveals that majority of the respondent hear about electric vehicle in daily basis that is 52.11%. The percentage of such respondent who discuss about electric vehicle is 82.13% whereas remaining 17.87% respondent does not ever discuss about electric vehicle. Study also finds that 49.88% of respondent discuss frequently about elective vehicle in gathering that is , 41.19% respondent discuss about electric in office, 28.78% respondent discuss about electric vehicle in home and remaining 0.99% respondent discuss with others. Likewise, 98.26% of the respondent were found to be motivated to buy electric vehicles after the discussion. Under which 72.21% of the respondents were found to be highly motivated. Moreover 15.88% were found to be moderately motivated, 9.93% were found to be extremely highly motivated and 0.25% were found to be motivated in low level. Additionally, 99.75% said that in next 7 years by 2030 they would like to purchase electric vehicle.

Most of the respondent i.e., 81.89% were encouraged to buy electric vehicle due to the benefit of Tax exemption followed by Environmental concern (65.76%), Promotional activities made by agencies/seller (18.61%), Promotional activities made by government (15.38%), Price of vehicle (11.66%) and others (4.96%) which includes benefit of Low operating cost, Less than Petrol costing, Features-Auto driving, Better than ICE vehicle and Mileage. Question related respondent's consideration in purchasing electric vehicle was also asked where majority responded i.e., 60.79% want to buy electric vehicle during next 5 year. Furthermore, 34.74% want to buy electric vehicle as soon as possible and 3.975 want to buy electric vehicle by 2030. Only 0.25% were unsure about their decision regarding purchase of electric vehicle.

Challenges Faced by Users while using Electric Cars

This section contains useful information about the issues and problems that creates the challenges in purchasing intention towards electric cars in Kathmandu valley. In the study only 4.22% of the respondent faced challenges while using electric vehicle.

Figure 2: Challenges faced during the use of electric cars



Source: Field Study, 2023

The challenges that user encounter when using electric vehicle is illustrated in above figure. Charging, display problem and availability of spare parts concern in the market are listed in the following diagram. Charging problems (1.99%) and Display problems (0.74%) and Availability of spare parts (0.7%) are the top three challenges. This shows that both businesses and consumers may not be successfully purchasing the electric cars in the current market. Furthermore, businesses and customers may become confused as a result of confusing government regulations and practices. Battery Drainage (0.5%), No spare tires (0.25%) and electric shock (0.25%) are a few additional noteworthy challenges. These issues imply that companies may need to make more concerns regarding in more efficient marketing plans and government policies, also reduce the price of the vehicle, and discover methods to lower the cost of production of electric cars for consumers. Besides these problems, due to booming in the use of electric cars, charging station has become most of the requirement for the public and service center especially for the electric is still less in number in the market. Also, due the high charge of bank interest rate and government tax is another challenge that create barriers for the customers to make decision more difficult in buying electric cars

Similarly, respondents were also asked the question about who are the Responsible agents for the Challenges of electric cars in the market. The agents listed in this diagram are accountable for the challenges in executing implementation of green marketing. It breaks down the frequency and proportion of respondents who said each agent was in charge of handling these challenges. The government policy (19.6%), company (17.37%), and customer (11.17%) have been named as the accountable agents. Additionally, Government alliances (7.69%), local governments (4.22%), and others (2.48%) were also noted as agents. These agents might assist in addressing the challenges of successful green marketing by giving resources and assistance to businesses and customers. 44.66% respondents believed that by increasing charging stations, electric vehicles can be promoted. Similarly, 25.55% respondents said increasing availability of spare parts is must in order to promote electric vehicles. Also, 16.87% respondents believed in decrease of tax and increase of subsidy by government, 13.89% respondents believed in proving the battery range by the company, 5.54% respondents believed in improving the service quality by service center, 18.36% respondents believed in decreasing bank interest rate, last other 3,47% respondents have different views to promote electric vehicle in Nepal.

Inferential Analysis

Measurement and structural models using partial least squares (PLS) modeling utilizing the SmartPLS 3.2.8 version was used in this study as the statistical tool because it precisely relies on the supposition that data in surveys are regularly distributed, however this is not the case in most surveys.

For Internal Consistent Reliability, Cronbach's Alpha and Composite Reliability is measured. The data must meet the requirement of CA>0.7 in order to show internal consistent dependability. Similar to that, the composite reliability needs to meet a few requirements. Better dependability levels are frequently

indicated by higher CR values. For example, ratings between 0.60 and 0.70 for Composite Reliability are considered "acceptable," whereas values between 0.70 and 0.90 are considered "satisfactory to good." However, values of 0.95 and higher are problematic because they imply that the elements are redundant. All criteria of Cronbach's alpha (CA) and Composite reliability (CR) are satisfied. As a result, the model of this study has internal consistency reliability.

Table 3: Internal Consistent Reliability

Constructs	Cronbach's Alpha (CA)	Composite Reliability
Att	0.794	0.849
Emo	0.802	0.875
Pbc	0.801	0.833
Pi	0.799	0.934
Sbn	0.763	0.825

For convergent validity, factor loading and average variances extracted (AVE) is measured. According to Vinzi et al. (2009) factor loadings above 0.70 are ideal while discarding and deleting signs with loading values of less than 0.4. Nevertheless, indicators should only be removed from a construct if doing so causes the values of CA, CR, and AVE to rise over a predetermined threshold. On the other hand, AVE values greater than 0.5 are often accepted (Aburumman et al., 2022; Sharma et al., 2024). Some indicators were found to have factor loadings below 0.7, and several constructs initially had an Average Variance Extracted (AVE) below the acceptable threshold of 0.5. Specifically, the constructs attitudes, emotions, subjective norms, perceived behavioral control, and purchase intention did not meet the AVE criterion. To address this, items with the lowest factor loadings were removed from each construct. For attitudes, items att1, att3, and att6 were dropped; for emotions, emo4, emo5, and emo6; for subjective norms, sbn1, sbn3, and sbn6; for perceived behavioral control, pbc2, pbc4, and pbc5; and for purchase intention, pi2, pi3, and pi6. After removing these low-loading items, all constructs achieved an AVE of 0.5 or higher, meeting the acceptable threshold for reliability and convergent validity. By statistical analyses like factor analysis and correlation analysis, discriminant validity can be proven. Correlation analysis can demonstrate that certain constructs are not highly connected with one another, whereas factor analysis can assist in identifying the many constructs that make up a test or scale (Comrey, 1988).

Table 4: Convergent Validity

Constructs	Indicators	Outer Loading	Average variance extracted (AVE)
Attitudes	att2	0.78	0.563
	att4	0.726	
	att5	0.744	
Emotions	emo1	0.768	0.575
	emo2	0.712	
	emo3	0.794	
Perceived Behavioral Control	pbc1	0.743	0.573
	pbc3	0.78	
	pbc6	0.748	
Subjective Norms	sbn2	0.814	0.57
	sbn4	0.568	
	sbn5	0.763	

Purchase Intention	pi1	0.756	0.522
	pi4	0.789	
	pi5	0.719	

For discriminant validity, the factor loading indications on the assigned construct must be greater than all loading on other constructs when considering the cross-loading. The HTMT values below 0.85 are considered more conservative threshold and significantly lower than 0.9 (Franke & Sarstedt, 2019). Similarly, if either of the two constructs' AVEs is greater than the squared correlation between the two constructs, then the Fornell and Larcker condition is met (Hair et al., 2017).

Table 5: Discriminant Validity – Fornell - Larcker Criterion and HTMT – Matrix

Fornell-Larcker Criterion						**HTMT Results**				
	att	emo	pbc	pi	sbn	att	emo	pbc	pi	sbn
att	0.75									
emo	0.351	0.758				0.565				
pbc	0.309	0.582	0.757			0.499	0.727			
pi	0.35	0.592	0.622	0.755		0.565	0.74	0.887		
sbn	0.35	0.554	0.55	0.577	0.723	0.621	0.731	0.84	0.877	

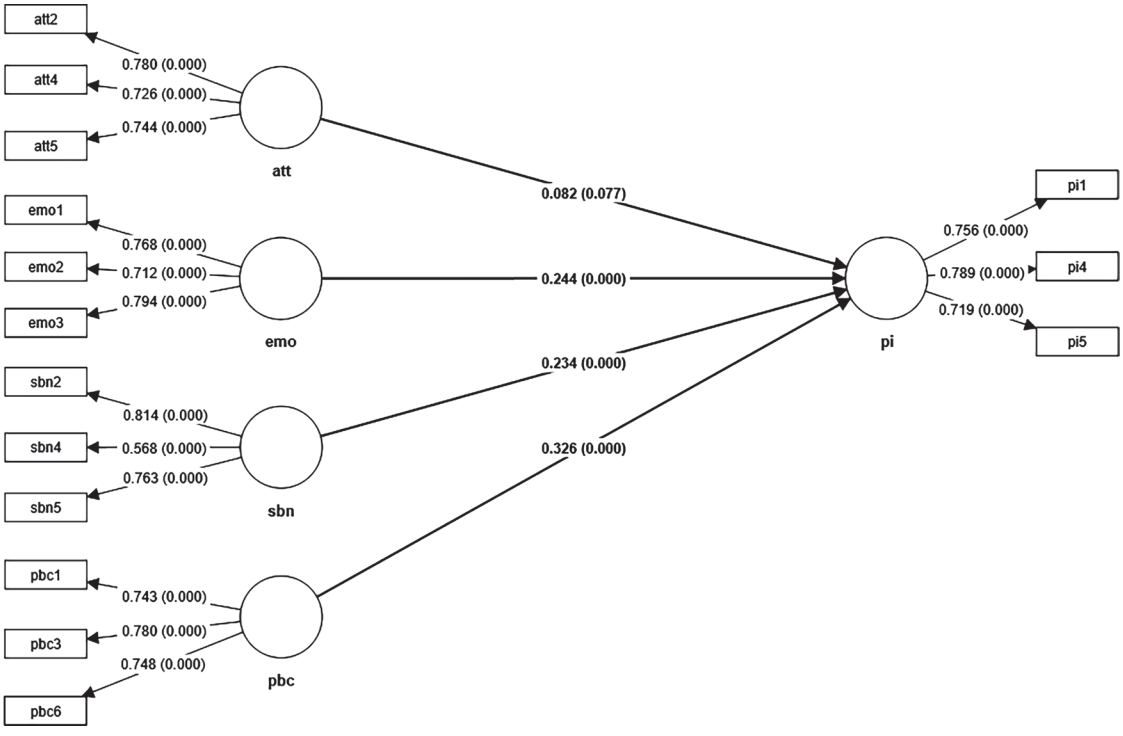
Table 6: Discriminant Validity – Cross Loadings

	Att	**Emo**	**pbc**	**pi**	**Sbn**
att2	**0.78**	0.242	0.215	0.26	0.305
att4	**0.726**	0.296	0.242	0.265	0.283
att5	**0.744**	0.252	0.237	0.262	0.2
emo1	0.288	**0.768**	0.474	0.448	0.373
emo2	0.207	**0.712**	0.404	0.443	0.439
emo3	0.303	**0.794**	0.445	0.455	0.447
pbc1	0.183	0.379	**0.743**	0.467	0.46
pbc3	0.247	0.436	**0.78**	0.483	0.382
pbc6	0.273	0.509	**0.748**	0.463	0.409
pi1	0.303	0.422	0.424	**0.756**	0.418
pi4	0.282	0.491	0.535	**0.789**	0.491
pi5	0.206	0.422	0.442	**0.719**	0.39
sbn2	0.26	0.52	0.459	0.501	**0.814**
sbn4	0.259	0.305	0.307	0.327	**0.568**
sbn5	0.249	0.344	0.41	0.402	**0.763**

Structural Model

Hair et al. (2019)'s advice, we presented the path coefficients, the standard errors, t-values, and p-values for the structural model using a 10,000-sample re-sample bootstrapping approach (Ramayah et al., 2018). This study has 4 hypotheses which have direct relationships. Path analysis is run with the help of Smart PLS Software and the calculation and interpretation is based on the result gather from the Smart PLS4. On the Smart PLS4 screen, the observed variables were linked to other variables, representing the hypothesized linkage in the conceptual model. The resulting path analysis results are usually displayed together in the form of a path diagram.

Figure 3: Structural Equation Modeling



Source: Field Study, 2023

The structural equation model created using Smart PLS is depicted in the figure. There are four structures totaling six components in this model. With a sample size of 10,000, bootstrapping is employed to determine the significant link between the variables. Figure 13 shows the path coefficient of the structural model developed where emotion, attitude, subjective norms and perceived behavioral control are independent variables and purchase intention is dependent variable.

Table 7: Hypothesis Test

Hypotheses		β	SD	T values	P values	LL	UL	
H1	att -> pi	0.082	0.046	1.77	0.077	-0.006	0.175	Not Supported
H2	emo -> pi	0.244	0.056	4.375	0	0.138	0.355	Supported
H3	pbc -> pi	0.326	0.06	5.419	0	0.206	0.441	Supported
H4	sbn -> pi	0.234	0.058	3.999	0	0.116	0.344	Supported

5. Discussion

The paper evaluates the buying interest of the masses regarding electric vehicles. The existence of fossil fuel resources and the periods of fuel shortages, frequent rise of fuel costs, the unceasing price growth of petroleum products have led to the appearance of a new trend fuel consumption and transportation cost reduction means in electric vehicles (EVs). Here, the current paper examined how attitudes, emotions, subjective norms, and perceived behavioral control could influence purchase intentions of consumers to electric cars. The results also show that the H1 was rejected, which implies that the attitude is not significantly related to purchase intention in the present research. Though the opinion demonstrates the assessment of an individual in relation to a behavior depending on personal beliefs and evaluations (Sun,

2020), and has been identified as a critical factor in the translation into purchase intention of electric vehicle in the current market (Fishbein and Ajzen, 1975; Moons and De Pelsmacker, 2015), the findings show that positive attitudes towards environmentally friendliness, fossil fuel decrease, and innovation may not be enough to transform into a purchase intention of electric cars in the current market conditions. This observation is contrary to the previous research that found out that persons with positive orientation towards innovation tend to embrace new technologies more (Rogers, 1995) and this result implies that there are other limiting factors that can overrule attitudinal factors. Conversely, H2 was accepted, which proved that there is a significant relationship between emotions and the purchase intention of electric cars. This finding is in line with the existing literature on the significance of the emotional aspects of consumer decision-making, especially when it comes to using new technologies (So et al., 2015; Watson and Spence, 2007; Ruiz-Mafe et al., 2018). The introduction of the affective elements into the cognitive models of decision-making, including the Technology Acceptance Model (Bagozzi, 2007), the Common Model of Cognition (Larue et al., 2018), and the Theory of Planned Behavior (Moons and De Pelsmacker, 2012; Parker et al., 1995), is also supported by previous research. The results indicate that emotional reactions, including excitement, pride, or a desire to be sustainable, are very important in driving the consumers to think of electric vehicles. Moreover, H3 and H4 were accepted which means that the subjective norms and the perceived behavioral control were very important in buying the electric cars. Subjective norms indicate the perceived social pressure of significant referent groups whereas the perceived behavioral control is the perceived ease or difficulty of carrying out the behavior (Fishbein and Ajzen, 1975). Personal capabilities and external enabling or limiting factors including charging infrastructure, affordability and policy support are some of the factors that determine the perceived behavioral control. These variables are important, which proves the importance of social influence and perceived feasibility in pushing EV adoption. On the whole, the results indicate that attitude was not a significant predictor of purchase intention, but emotions, subjective norms, and perceived behavioral control have a significant impact on consumer purchase behavioral intention towards electric cars. Moreover, the post-COVID-19 era has only increased the rate of technological implementation and awareness of alternative energy provisions, which further inflates the desire towards the use of electric vehicles during petroleum fuel shortages. Thus, the Theory of Planned Behavior proves to be an acceptable and strong model of studying purchase intention to electric cars, especially when further developed to include emotional components.

6. Conclusion

This study explored the factors influencing the purchase intention of electric vehicles (EVs) in Kathmandu Valley using an extended Theory of Planned Behavior framework. The findings reveal that emotional drivers, social influences, and perceived control over resources and infrastructure play a significant role in shaping consumers' intentions to adopt EVs. In contrast, general positive attitudes toward EVs alone do not directly translate into purchase intention, highlighting the importance of affective and social-psychological factors over purely cognitive judgments in markets with emerging infrastructure and perceived risk.

The research also identifies key adoption barriers, such as inadequate charging infrastructure, limited access to spare parts, and technical issues. Critical facilitators for purchase intention include incentives like tax exemptions, environmental awareness, strong social influence, and visible, reliable after-sales support. These findings suggest that successful EV adoption requires not only economic and functional incentives but also the cultivation of positive emotional experiences and trust through social networks and well-equipped support systems.

From a practical perspective, the results provide guidance for stakeholders, including automakers, marketers, and policymakers. Manufacturers and marketers should focus on creating experiential campaigns that generate pride, excitement, and a sense of modern technological engagement while ensuring comprehensive support infrastructure to enhance perceived control. Policymakers should prioritize investment in charging stations, provide fiscal incentives, and promote public awareness

campaigns through social media to strengthen social norms and knowledge dissemination. Finally, while the study provides valuable insights into consumer behavior in Kathmandu Valley, it also points to several avenues for future research. Expanding studies to other regions, exploring additional demographic groups, integrating constructs like environmental concern and perceived value, and employing mixed-methods or longitudinal designs could offer a more comprehensive understanding of EV adoption. Investigating post-adoption behavior, comparative studies across different types of electric mobility, and the influence of emerging technologies would further enhance the knowledge of consumer adoption patterns and sustainable mobility in Nepal.

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