Understanding the Factors behind Consumers' Purchase Intention toward Electric Cars in India

Varuni Sharma
Malaviya National Institute of Technology, Jaipur; Manipal University Jaipur

Dipti Sharma
Malaviya National Institute of Technology, Jaipur

Harish Sharma*
Manipal University Jaipur

ABSTRACT

The government claims that India will embrace a future of electric vehicles, with 70% of car consumers considering electric cars for their next vehicle compared to the global market with 52.1%. With a vision, the government introduced the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME) Policy, a phase II scheme, in 2019. To achieve this target, different states of India have launched their electric vehicle policies. The majority of people in India will prefer full-battery electric cars (49%) over plug-in-electric cars (21%), as per the report by McKinsey. This survey also claimed that consumers are on the board with sustainability. Sustainability increasingly influences consumer decisions; 75% of Indians have either started to change or have already changed their buying behavior and consumption patterns. However, pure electric vehicle penetration currently remains relatively low in India, 0.1% in 4Ws, 0.2% in 2Ws, and practically nil for commercial vehicles due to several reasons, including a significant affordability gap and low level of consumer acceptance, low level of electric vehicle manufacturing activities, lack of comparable products especially in 2Ws and 4Ws and low existent public charging.

Keywords: Consumers' purchase intention; decision-making; electric car adoption; consumers' behavior.

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1. INTRODUCTION

Every economy is trying to enhance the pace of economic development, and it is costing us our environment. Technological advancement is a crucial factor in economic development. However, technological advancement never comes alone; the outcome is the degradation of the environment with every passing day. The presence of carbon emissions is making the air hazardous to inhale for all living organisms. The main reason for the emissions is the use of crude oil, which is non-renewable. Now, every country needs to curb these emissions as these emissions are directly affecting our environment adversely. The emissions from the transport sector impact our health instantly. So, adopting electric vehicles can solve these immediate impacts on our lungs(Jaiswal *et al*., 2021). More and more countries are switching towards adopting electric cars. However, it is a new technology, so people are skeptical. The adoption of electric vehicles has been difficult. However, the adoption of electric vehicles in the last five years has increased. Electric

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three-wheelers have seen tremendous growth as a means of public transport in India.(Barbarossa & De Pelsmacker, 2016). If we rank electric vehicles, electric 3-wheelers come on first rank, then electric two-wheelers, after these two electric cars come. However, it is essential to mention that most electric three-wheelers are not registered vehicles, so there is a safety concern. Nevertheless, people are adopting this practice because it reduces the price of the vehicle. Apart from electric three-wheelers, electric two-wheelers are also bought in large numbers. The reason behind the acceptance of electric scooters is that the price range of conventional and electric scooters is almost the same. However, the same is not the case for electric and conventional cars; there is a vast difference in the prices of these two. It has been the primary reason for not adopting electric cars in India. Nevertheless, there are other reasons for avoiding purchasing electric cars. This gap needs to be studied. A consumer's behavioral intention is dependent on many factors apart from price. We need to find the drivers that help us understand why electric vehicles are adopted. As per the survey report by the Society of Manufacturers of Electric Vehicles India, 2020, the adoption of electric cars is merely 1% in the automobile industry despite numerous measures taken by companies and the government. In countries like Norway, which is a worldwide portent in the field of electro-mobility, the share of electric vehicles is about 2% of all passenger vehicles. Being advantageous is not yet enough to persuade consumers to adopt electric vehicles. (Li *et al*., 2017). Like other countries, the Indian government is also taking positive initiatives to promote various utility prospects that Electric cars would serve; unfortunately, there still seems to be resistance to Electric car adoption.- (Chhikara *et al*., 2021). We specifically find an answer to the question: "What support ecosystem do we need to develop to make Electric cars mainstream?"

In India, different states have different electric vehicle policies. These policies must be studied thoroughly to understand consumers' buying behavior for electric cars. Rajasthan state is an ideal state to start the research on understanding the factors responsible for the acceptance of electric car. It is the biggest state of India in terms of land area. The state government has introduced Rajasthan Electric Vehicle Policy (REVP) in august 2022. This policy aims to foster research and development, skill development, and the state's manufacturing of electric vehicles and batteries. It incentivizes creating public charging infrastructure, power tariffs for electric vehicle charging, and renewable energy-based charging stations. The policy also aims to identify the supply and demand side gaps and practices that can be undertaken by state-level authorities to ease the transition to electric vehicles. The policy also offers incentives such as SGST (State Goods and Services Tax) reimbursement and one-time grants based on the battery capacity of the EV. This helps reduce the upfront cost for buyers and encourages EV adoption. Thus, focus on low-cost EVs aligns with the needs of the local population and promotes sustainable mobility options. While other states in India have also implemented EV policies, Rajasthan's policy stands out due to its focus on incentives, manufacturing ecosystem development, and skill development programs

2. THEORETICAL FOUNDATION AND HYPOTHESIS

The transportation sector needs to change. As the population increases, congestion and traffic grow, and road emissions increase daily. Inhaling these emissions makes us ill. Adopting green transport will help us free from carbon emissions on the road, and the immediate impact of emissions will be reduced. (Guttikunda *et al*., 2014). Also, much energy can be saved if we adopt electric vehicles. In this subsequent section of the literature review, we will focus on earlier studies in the context of various countries and their processes of Electric Vehicle adoption.

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When a consumer intends to purchase a new product, many factors are responsible for buying a product, like attitude, perceived behavior, subjective norms, etc. (Shalender & Sharma, 2021). However, there are many concerns with adopting new technology. No one has an idea of how the new technology works, how they will get assistance if needed, how much extra they need to pay, what are the facilities provided by the government, how insurance companies will help, whether maintenance will be easy or not, how many substitutes are available. (Verma *et al*., 2020) So, it is a prolonged exercise for a consumer to buy a new technological product. To avoid such an exercise, consumers like to go with the flow and buy what most consumers believe. (Song & Ko, 2017)

2.1 Theory of Planned Behavior to understand a consumer's behavioral intention.

Many theories related to consumer behavior are available in the literature; the best-unified theory can be a theory of planned behavior. The approach intends to explain all behaviors over which people can exert self-control. This theory tells that people behave according to their attitudes, subjective norms, and perceived behavioral control. (Ajzen, 1991). These factors should be considered during decision-making as they play a crucial role in the decision-making process. So, our analysis model will use the theory of planned behavior. (Kautonen *et al*., 2015). We will add more factors to the existing idea as per the available literature. For studying consumer purchase intention, we need to add more elements, which will give us more practical evidence related to the slow adoption of electric cars in India. According to a study, perceived cost, attitude, subjective norms, perceived behavior, and awareness significantly impacted customers' intentions to purchase electric vehicles. (Asadi *et al*., 2021). Also, this article will study the impact of age, gender, income, and education on technological anxiety and awareness. This way, we can identify the effect of a number of factors on the behavioral intention to buy an electric car. One study indicated that EV adoption could be viewed as a behavioral response, including purchase and use. As a result, in this evaluation, the intentions to adopt include purchasing intentions, using preferences, consumer preparedness, willingness to pay, willingness to accept, and other related proxy factors.(Rezvani *et al*., 2015).

2.1.1 Attitude toward buying an electric car.

An individual's favorable or unfavorable attitude toward an object is a consumer attitude. As we all know, a positive attitude increases the likelihood of purchasing a product, which increases the possibility of liking or disliking a product. (Kang *et al*., 2006). According to the study, although positive and social incentives drive positive attitudes, negative motives discourage and negatively impact electric car adoption (Sukmadewi, 2023). Attitude is essential in developing attitudes toward electric car buying (Sahoo *et al*., 2022). Attitude has been a significant factor in defining a consumer's behavior. In all fields, acceptance comes with a positive attitude. (Li *et al*., 2017). According to the Technology Acceptance Model, an individual's attitude toward specific technology influences his willingness to accept the technology. (Davis, 1989). Regarding artificial intelligence, bitcoins, fintech, or any new applications, attitude eases adoption. (Agarwal & Prasad, 1999). Attitude towards the activity and perceived behavioral control are the most frequently significant variables responsible for this explained difference in intention. (Godin & Kok, 1996).

Hypothesis 1 (H_1): *Attitude significantly impacts the purchase intentions of an electric car.*

2.1.2 Perceived behavioral control and intention to buy an electric car.

Behavior as perceived control manifests one's thoughts and perceived power as an outcome. Control beliefs are defined as a person's belief in particular factors that may

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obstruct the evaluation of a specific behavior. We should always account for both perceived and actual control to forecast technological adoption. (Lynne *et al*., 1995) and (Del Giudice Lopez Wurong Shih, 2023). We buy any product; we have strong beliefs, and based on that, we behave in a particular way. (Kang *et al*., 2006). As a result, the greater the utility consumers see from EVs, the more likely they will hold a good attitude and establish the intention to adopt EVs. (Wang *et al*., 2018). These beliefs must be satisfied, and we are ready to buy the product. But even after many government policies, consumers' beliefs could be more robust. Once we become sure, the adoption of electric cars will move toward the take-off stage.

Hypothesis 2 (H_2): *Perceived Behavioral Control has a significant and positive impact on the purchase intentions of an electric car.*

2..1.3 Subjective norms and intention to buy an electric car.

Several factors influence consumer purchase decisions, including subjective norms. Subjective norms are a person's perspective of what others believe they should do. The impact of subjective norms on consumer purchase decisions is investigated in this study. (Chhikara *et al*., 2021) By purchasing green items like EVs, consumers can project a socially visible image of good citizenship and a friendly neighborhood, and they might feel gratified by getting others' praise. (Ng *et al*., 2018). When a consumer buys a product, he pays attention to what his fellow people say or suggest. (Moons & De Pelsmacker, 2012). It is essential for a human being to be acceptable in society. So, being a social person, we know what products are near and dear ones suggest we buy them. (Westin *et al*., 2018). As human beings, we are concerned about socio-demographics. (Ramayah *et al*., 2009).

Hypothesis 3 (H_3): *Subjective Norms significantly and positively impact the purchase intentions of an electric car.*

2.2 Awareness and intention to buy an electric car.

Consumer awareness ensures buyers or customers know information on products, goods, services, and consumer rights. Consumer knowledge is essential so that purchasers may make the right choices and choose at the right moment. Some findings also indicate that consumers' lack of awareness regarding EVs and their perception of EV risk may be psychological hurdles to their acceptance of EVs. (Bailey *et al*., 2015). Education is vital in creating consumers' awareness of buying a new product. How one can manage an electric car is essential and should be known to all. The government should make people aware of the benefits, and then we can expect more acceptance for electric cars. (Okada *et al*., 2019). The technological anxieties or perceived risks can be minimized, and adoption can be enhanced accordingly. Consumers also need to be aware of environmental degradation. Then, the adoption will be sustainable. (Shi *et al*., 2017).

Hypothesis 4 (H_4): *Awareness has a significant and positive impact on the purchase intentions of an electric car.*

2.3 Perceived cost and intention to buy an electric car.

People are seeking government subsidies that can cover a portion of the cost of purchasing an electric car through tax rebates. Previous studies in India have discovered that there is already a lack of charging infrastructure, and the high cost of an electric vehicle all act as hurdles to user adoption. (Khurana *et al*., 2020). Few studies suggest that some subsidies and incentives make electric cars cheaper and boost electric car perception. (Sahoo *et al*.,

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2022). Cost is an essential concept in electric cars because these cars are more costly than traditional cars. (Carley *et al*., 2013).

Hypothesis 5 (H_5): *Perceived cost has a negative impact on the purchase intentions of an electric car.*

2.4 Availability of substitute and intention to buy an electric car.

The availability of a product that consumers can purchase rather than the industry's offering. A substitute product is one from another industry that gives the same benefits to the consumer as those provided by the firms in the industry. The reason to adopt fewer electric cars is a huge variety of traditional cars available to consumers, which they can buy according to their budget and choices. But the same is not valid with electric cars. Very few models are available to consumers, and they must choose only those models.(Kihm & Trommer, 2014). That reduces the interest of consumers in electric cars. Consumers like to investigate correctly before buying a product, and they need to pay a considerable amount to buy a product.(Berry & Pakes, 2007).

Hypothesis 6 (H_6): *The availability of substitutes has a negative impact on the purchase intentions of an electric car.*

2.5 Technology anxiety and intention to buy an electric car.

An explosion of new technology is transforming the retail landscape. However, not all consumers opt to employ new technology, and not all consider these developments positive. (Meuter *et al*., 2003). Anxiety about using a new product is a psychological characteristic that has received much attention in social psychology research and has been characterized in various ways. According to Dunn *et al*., Technological anxiety relates to the projected negative utility that customers connect with purchasing a specific product or service. (Dunn *et al*., 1986). It is widely believed that consumers' major obstacle to adopting innovative technology is anxiety about using an electric car. (Qian & Yin, 2017)

Hypothesis 7 (H_7): *Technology anxiety has a negative impact on the purchase intentions of an electric car.*

2.6 Behavioral intention and intention to buy an electric car.

The inclination to purchase a service or goods from the same entity and share the experience with relatives and friends is behavioral intention. Simply put, we can say that when a consumer intends to buy an electric car, they will make things work accordingly. So, if a country wants to increase electric car adoption, it must elevate consumers' behavioral intention towards electric cars. (Li *et al*., 2017). Consumers have different levels of information and knowledge about electric cars. It becomes difficult to teach all consumers in the same way. Pro-EV behavioral intentions must be developed if we want fast acceptance. (Cheng *et al*., 2020)

Hypothesis 8 (H_8): *Behavioral intention positively impacts the purchase intentions of an electric car.*

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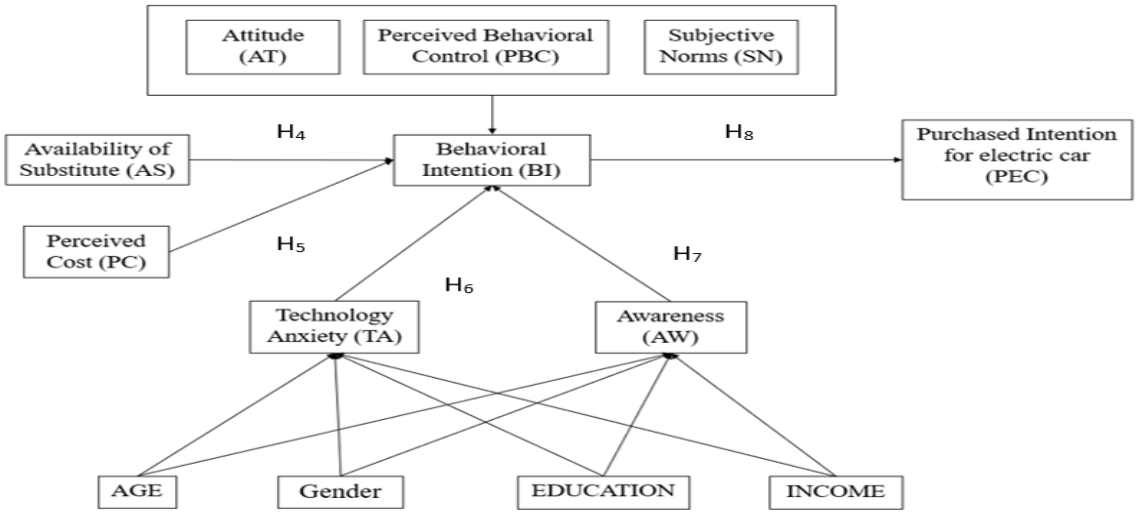

Figure 1. Research Method

3. RESEARCH METHODOLOGY

In Rajasthan, Jaipur, Jodhpur, and Kota cities have been considered as sample. The population here is more than 1.5 million. So, these cities are facing issues of congestion and traffic. Even the state government has these cities on the priority list for adopting electric vehicles as per EV policy. The focus was to understand the attitude of potential buyers of electric cars, considering the different factors. In this study, we have considered attitude, perceived behavioral control, subjective norms, awareness, perceived cost, availability of substitutes, technology anxiety, and behavioral intention. A two-stage cluster sampling method has been used to collect data for the sample. Here, we wanted to study the behavior of consumers willing to buy a car. Demographic data was also recorded to analyze if there is any impact of age, gender, income, and education on intention to buy an electric vehicle. In one of the studies conducted in Norway and Sweden, the adoption of electric cars is influenced positively by age and education level. (Westin *et al*., 2018).

3.1 Instruement of Research

The questionnaire was created in simple language so participants could comprehend it and reply accurately. A quantitative technique was utilized to analyze the impact of awareness, perceived cost, availability of substitutes, and technology anxiety on the intention to purchase electric cars. The questionnaire was developed using a validated scale. It has, however, been slightly adjusted to fulfill the standards. A five-point Likert scale was employed (strongly agree = 5 to strongly disagree = 1). A list of all car dealer showrooms from Jaipur, Jodhpur, and Kota has been created. Subsequently, a few areas were selected, and a two-stage cluster sampling method was used. In this case, the clusters were randomly chosen, and then the consumers were interviewed randomly inside those clusters. In-person interviews were also conducted from some of the showrooms of these cities to fetch data from potential car buyers.

3.2 Data Collection

The researcher located the vehicle dealer showrooms in Jaipur, Jodhpur, and Kota and created four city zones: north zone, south zone, west zone, and east zone. The showrooms

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were selected randomly from each area, and data was collected from potential buyers. The survey was conducted in person. Some help from the car showrooms' employees was also taken, as they were getting the data filled by potential buyers who visited showrooms to buy cars. Few were interested in purchasing electric automobiles, while others were not, indicating that they were solely interested in buying traditional cars.

Our research aims to understand consumer behavior in purchasing an electric car. The minimum sample size to be taken was 340, as per the literature and statistical formula for calculation. The researcher has collected data from 400 respondents from each city. In Jaipur, out of 400 responses, 384 remained after cleaning the data. There were 312 male respondents and 72 female respondents. In Jodhpur, out of 400, 393 remained after cleaning the data. There were 308 male respondents and 85 female respondents. In Kota, out of 400, 347 remained after cleaning the data, and it included 288 male respondents and 59 female respondents. Thus for the final study, 384 sample size was considered from Jaipur, 393 from Jodhpur, and 347 from Kota for data analysis. So, in total, the sample size was 1,124 respondents.

At the same time, while collecting the samples, it was kept in mind that for SEM (Structural Equation Modelling), we should have ten responses for each question, meaning one should follow N: q. (Schreiber *et al*., 2006).

3.3 Results and Interpretation

For analyzing the data, the researcher used SMART-PLS software to do path analysis as data was found to be non-normal even after data cleaning. However, it should be remembered that when dealing with real-time samples, non-normal data may come, but data is essential. To check the generalization of the data, the bootstrapping method has also been run in the software. SMART-PLS employs bootstrapping to assess the significance of estimated path analysis and PROCESS coefficients. Bootstrapping creates subsamples from the original data set (with replacement), which are then used to estimate the path analysis and PROCESS model. (Streukens & Leroi-Werelds, 2016).

3.3.1 Demographic Data

Table 1: Respondents' demographics

Gender	**n**	**%**
Male	908	81
Female	216	19
Total	**1124**	**100**
Age		
25-30 years	387	34.4
31-35 years	583	51.8
36-40 years	154	13.8
Total	**1124**	**100**
Ownership of cars		
Yes	426	38
No	698	62
Total	**1124**	**100**
Decision to buy		

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Traditional Car	1007	89.59
Electric Car	117	10.40
Total	**1124**	**100**
Education Level		
Secondary School	30	2.6
Graduate	796	70.8
Postgraduate	298	26.5
Total	**1124**	**100**

3.4 Reliability and Validity

Cronbach's alpha (Temme *et al*., 2010)(Tavakol and Dennick 2011), Composite reliability (Bacon, Sauer, and Young 1995), and average variance. (dos Santos & Cirillo, 2021) were calculated to assess the reliability and validity of the factors like attitude, perceived behavioral control, subjective norms, awareness, perceived cost, availability of substitutes, technological anxiety, and intention to buy an electric vehicle. The table. 2 shows that the values are deemed to be acceptable. As per the given literature, the fair value of Cronbach alpha and composite reliability should lie near 0.7. Values less than 0.9 are also acceptable. The value of the Average variance extracted should also be above 0.5. Sometimes, a little less than 0.5 value can also be good.

Table 2

Factors	**Cronbach's alpha**	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**The average variance extracted (AVE)**
Attitude	0.818	0.843	0.837	0.728
Subjective Norms	0.71	0.927	0.901	0.567
Perceived Behavioural Control	0.722	0.814	0.785	0.544
Awareness	0.739	0.78	0.721	0.512
Perceived cost	0758	0.897	0.954	0.765
Availability of Substitute	0.895	0.904	0.895	0.633
Technological Anxiety	0.786	0.865	0.834	0.599
Intention to Buy Electric Vehicle	0.875	0.881	0.796	0.712

Cross-loadings of latent variables have been checked to identify the reliability and validity of the given conceptual model. A cross-loading occurs when a variable is discovered to have more than one meaningful loading (depending on sample size). Alternatively, in cross-loadings, we check how well each item has been loaded to one or more factors. In this way, the optimality of the good fit model is checked. One must remember that a particular loading should load well at its latent loading. If not so, the constructs need to be defining the variable correctly. (Temme *et al*., 2010). Some constructs have been removed as the factors were not loading perfectly. These are AT_3, PBC_2, SN_5, PC_2, PC_3, AS_1, AS_5, TA_1, TA_3, BI_1, BI_2 and BI_4.in Table. 3 we need to reconstruct the items and constructs. The Fornell-Larcker Criterion method was also checked in Table. 4. Also, outer loadings have been checked using the Bootstrapping

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method again. Here, we check the significance of the data using p-values here. The p-value should be zero or approaching to be zero.

The following questions have been modified and taken from a validated scale.

Table 3: Cross Loadings

	AT	PBC	SN	AW	PC	AS	TA	BI
Attitude								
I am considering buying an electric car	**0.923**	0.615	0.663	0.565	0.482	0.665	0.501	0.654
Buying an electric car will be beneficial in each way	**0.955**	0.591	0.505	0.625	0.343	0.690	0.529	0.563
Purchasing an electric vehicle is a sound investment.	**0.439**	0.509	0.562	0.551	0.266	0.517	0.568	0.589
I intend to purchase an electric car.	**0.860**	0.507	0.501	0.462	0.368	0.561	0.631	0.562
Buying an electric car is desired.	**0.897**	0.575	0.550	0.453	0.436	0.631	0.619	0.53
Perceived Behavioral Control								
I'll buy one if I learn everything there is to know about electric vehicles.	0.585	**0.803**	0.548	0.344	0.235	0.368	0.539	0.342
I am well-versed in all aspects of electric vehicles.	0.459	**0.638**	0.531	0.456	0.523	0.558	0.419	0.654
I am willing to buy an electric car because there are no ifs and buts.	0.79	**0.901**	0.605	0.543	0.478	0.527	0.484	0.664
I have enough money to buy an electric car.	0.378	**0.876**	0.542	0.343	0.276	0.379	0.559	0.345
If it is entirely up to me, I will purchase an electric vehicle.	0.554	**0.833**	0.536	0.459	0.517	0.558	0.489	0.344
Subjective Norms								
People who are important to me would appreciate my green purchase if I purchased an electric automobile.	0.298	0.357	**0.638**	0.047	0.235	0.133	0.289	0.454
People who are important to me would encourage me to purchase an electric vehicle.	0.434	0.231	**0.778**	0.121	0.322	0.454	0.341	0.555
People who matter to me would support my decision to get an electric vehicle.	0.189	0.122	**0.735**	0.042	0.199	0.001	0.221	0.154
I would follow the social development trend if I got an electric automobile.	0.586	0.578	**0.852**	0.434	0.669	0.499	0.563	0.544
People who matter to me anticipate that I will purchase an electric car as my primary mode of transportation.	0.687	0.637	**0.607**	0.385	0.511	0.449	0.711	0.598
Awareness								
I have sufficient expertise in electric vehicles.	0.385	0.426	0.133	**0.596**	0.278	0.502	0.293	0.234

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I am familiar with the technologies associated with an electric vehicle.	0.584	0.547	0.383	**0.862**	0.350	0.412	0.510	0.342
I was aware of the premium and other facts relating to battery swapping before purchase,	0.324	0.318	0.214	**0.698**	0.282	0.540	0.413	0.401
I can obtain roadside help wherever I wish	0.299	0.293	0.172	**0.413**	0.183	0.238	0.244	0.129
Even on motorways, charging my electric car is simple.	0.354	0.456	0.319	**0.444**	0.229	0.432	0.367	0.378
Perceived Cost								
Electric automobiles are easily purchased on EMI; paying more for them has no influence.	0.254	0.373	0.484	0.298	**0.717**	0.382	0.459	0.558
If the government discontinues income tax breaks, purchasing an electric vehicle will be advantageous.	0.449	0.435	0.412	0.342	**0.504**	0.505	0.676	0.498
An electric vehicle will provide numerous economic benefits.	0.561	0.586	0.489	0.379	**0.679**	0.449	0.575	0.558
Even at public charging stations, charging an electric automobile will be cost-effective.	0.227	0.243	0.356	0.388	**0.799**	0.319	0.135	0.232
I don't need a government subsidy or incentive to buy an electric automobile.	0.267	0.398	0.438	0.320	**0.706**	0.472	0.452	0.374
Availability of Substitute								
I can afford a better traditional car for the price of an electric car.	0.595	0.615	0.523	0.548	0.723	**0.680**	0.644	0.540
There are few possibilities for electric vehicles.	0.615	0.553	0.436	0.533	0.570	**0.821**	0.601	0.471
Traditional automobiles do not cause range anxiety.	0.438	0.479	0.124	0.396	0.463	**0.637**	0.466	0.399
Traditional vehicles may quickly obtain roadside help.	0.556	0.594	0.228	0.550	0.335	**0.733**	0.537	0.422
I generally drive intra-city rather than inter-city.	0.663	0.600	0.377	0.568	0.455	**0.479**	0.643	0.221
Technological Anxiety								
I may encounter problems on the road, but I will quickly obtain roadside assistance.	0.650	0.676	0.563	0.569	0.600	0.692	**0.693**	0.621
I am not concerned about adopting new technologies.	0.385	0.511	0.449	0.611	0.590	0.657	**0.765**	0.433

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I'm not concerned about the range of an electric car on a single charge if I'm driving within city limits.	0.735	0.692	0.626	0.497	0.553	0.626	**0.508**	0.511
If I drive within city limits, I'm not concerned about the resale market for electric cars.	0.511	0.449	0.711	0.447	0.874	0.567	**0.790**	0.565
While traveling on highways, charging infrastructure may not be an issue.	0.622	0.548	0.646	0.626	0.497	0.485	**0.721**	0.487
Behavioral Intention to buy an electric Car								
I'm thinking about buying an electric automobile because they don't pollute the environment too much.	0.650	0.676	0.563	0.569	0.600	0.692	0.459	**0.693**
For the environment's sake, I will switch to an electric vehicle.	0.449	0.435	0.412	0.342	0.615	0.523	0.676	**0.574**
I am willing to spend more for an electric vehicle	0.561	0.586	0.489	0.379	0.553	0.436	0.575	**0.932**
Protecting the environment is more vital than hunting for a high-priced electric car.	0.227	0.243	0.356	0.388	0.479	0.124	0.135	**0.412**
I am interested in purchasing an electric vehicle.	0.735	0.692	0.626	0.497	0.594	0.228	0.452	**0.908**

Table 4: Fornell-Larcker Criterion

	AT	**PBC**	**SN**	**AW**	**PC**	**AS**	**TA**	**BI**
Attitude	**0.848**							
Perceived Behavioral Control	0.634	**0.642**						
Subjective Norms	0.458	0.432	**0.817**					
Awareness	0.726	0.655	0.646	**0.796**				
Perceived Cost	0.769	0.592	0.64	0.732	**0.901**			
Availability of Substitute	0.796	0.623	0.55	0.715	0.76	**0.729**		
Technological Anxiety	0.654	0.374	0.589	0.441	0.66	0.628	**0.74**	
Behavioral Intention to Buy an Electric Car	0.765	0.489	0.532	0.487	0.654	0.611	0.659	**0.88**

Table 5: Outer Loadings

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
AT → AT1	0.812	0.809	0.05	23.95	0
AT → AT2	0.847	0.945	0.057	18.96	0
AT → AT4	0.93S9	0.747	0.032	12.88	0
AT → AT5	0.82	0.717	0.051	15.126	0
PBC → PBC1	0.805	0.901	0.051	16.696	0

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PBC → PBC3	0.703	0.801	0.066	11.616	0
PBC → PBC4	0.538	0.436	0.087	7.194	0
PBC → PBC5	0.9	0.901	0.063	13.28	0
SN → SN1	0.438	0.429	0.123	4.564	0
SN → SN2	0.335	0.329	0.121	3.776	0.006
SN → SN3	0.852	0.839	0.055	14.537	0
SN → SN4	1.077	1.064	0.044	23.729	0
AW → AW1	0.995	0.995	0.054	19.468	0
AW → AW2	0.717	0.715	0.069	9.443	0
AW → AW3	0.706	0.704	0.063	12.161	0
AW → AW4	0.88	0.879	0.036	25.297	0.03
AW → AW5	0.821	0.82	0.055	15.956	0
PC → PC1	0.637	0.633	0.062	12.279	0
PC → PC4	0.733	0.73	0.051	16.431	0.001
PC → PC5	0.879	0.877	0.052	15.913	0
AS → AS2	0.89	0.889	0.025	36.951	0
AS → AS3	0.911	0.91	0.026	37.667	0
AS → AS4	0.821	0.82	0.055	9.560	0
TA → TA2	0.637	0.633	0.062	14.779	0
TA → TA4	0.733	0.73	0.051	23.346	0
TA → TA5	0.879	0.877	0.052	19.531	0
BI → BI3	0.89	0.889	0.025	9.477	0
BI → BI5	0.611	0.91	0.026	13.333	0

3.5 Path Analysis

We have used path analysis to observe and evaluate the effects of variables on purchase intention for electric cars in Table. 6. Path analysis estimates the given constructs by creating a conceptual model in structural equation modeling. (Edwards & Lambert, 2007). We compute the path coefficient, p_{ij}, for each path to a Purchase Intention (i.e., endogenous variable), where "i" represents the effect and "j" means the cause. When we square a route coefficient, we receive the fraction of the variance of the affected variable caused by the causal variable. Suppose all other causal factors are maintained constant. In that case, the coefficient might be positive (raising the causal variable causes an increase in the dependent variable) or negative (increasing the causal variable decreases the dependent variable).

The significance has been checked at a 5% significance level. The purchase intention for electric cars is significantly related to attitude, perceived controlled behavior, subjective norms, awareness, perceived cost, availability of substitutes, and technological anxiety. In path analyses, we have checked the values of r^2(coefficient of determination), q^2(predictive validity), and f^2(effect size) to find out the validity and reliability of the data. Muthen defines it as "a synthesis of cross-validation and functions fitting with the perspective that the prediction of observables is far more important than the estimation of what are frequently artificial construct parameters."

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Table 6: Path Analysis

		Coefficients	Significance	Decision	r^2	q^2	f^2
H_1	AT ⇒ PI	0.456	0.003	Supported	0.633	0.507	0.623
H_2	PBC ⇒ PI	0.342	0.112	Supported	0.434	0.511	0.339
H_3	SN ⇒ PI	0.187	0.005	Supported	0.203	0.54	0.366
H_4	AW ⇒ PI	0.552	0.655	Supported	0.656	0.598	0.490
H_5	PC ⇒ PI	-0.421	0.078	Supported	0.455	0.45	0.545
H_6	AS ⇒ PI	-0.689	0.331	Supported	0.247	0.347	0.279
H_7	TA ⇒ PI	-0.487	0.254	Supported	0.508	0.603	0.487
H_8	BI ⇒ PI	0.745	0.779	Supported	0.493	0.42	0.50

4. DISCUSSION AND INTERPRETATION

To identify the factors responsible for adopting electric cars, we have considered the extension of the theory of planned behavior as this theory explains the behavior of consumers in detail. In this paper, apart from the original model of planned behavior, some constructs like awareness, perceived cost, availability of substitutes, technological anxiety, and behavioral intention to purchase an electric car. The results reveals that all these factors significantly impact a consumer's adoption behavior. The study highlights that awareness, attitude, perceived behavioral control, and subjective norms positively and especially impact the adoption of electric cars, which means consumers intend to buy electric vehicles if these all are positive. On the other hand, the availability of substitute, technological anxiety, and perceived cost has a negative and significant impact on the adoption of the electric car. These deter a consumer to buy an electric vehicle.

5. CONCLUSION AND RECOMMENDATIONS

To conclude the present study unveils the following from the primary study conducted in Rajasthan state in India.

- All the hypotheses taken in the present research have been accepted and supported. There is a significant linkage between consumers buying behavior and purchase intention for electric cars. When consumers feel positive about the electric car or are enthusiastic about it, they will buy it.
- Our society has some specific beliefs, and we also follow the same in our lives. These beliefs slowly become our perceived behavior. Society's perception and what we believe at our inner level impacts behavior toward adopting electric vehicles in India.
- To add a new dimension to the original model of the theory of planned behavior, we added four factors, in which awareness showcases that if government or schools make people aware, the adoption will be higher than without understanding. In the interviews, the researcher found that people are primarily graduates and don't have much information about electric cars, so most people are waiting for others to buy first. They feel worthy enough to stay. The government can invest in building a robust charging infrastructure network across the country to address range anxiety and encourage EV adoption
- Consumers, as it is evident from the present study of Rajasthan state, want the cost of electric cars to be reduced. They calculate the amount they need to pay extra for one

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EV at home. So, government subsidy and any financial support is required by people in India. Opting for new technology is a scary decision for most people. The government can offer incentives such as tax credits, subsidies, and reduced registration fees to make EVs more affordable for consumers.

- Apart from all these, manufacturers need to be more transparent about the queries related to electric cars. The more clarity consumers get from companies, the more they buy. Collaboration between the government, automakers, and other stakeholders can help accelerate the adoption of EVs in India by addressing challenges such as charging infrastructure, battery technology, and consumer awareness.
- Battery swapping is a promising solution for addressing range anxiety and reducing the upfront cost of EVs. The government can encourage battery swapping by offering incentives to companies that provide this service.
- Companies should be encouraged to give lucrative offers to increase sales apart from government support. Social awareness can be provided using social media or other sources. Sustainability is currently the priority of all countries. The researchers attempted to comprehend the impact of all these factors to understand the consumer's purchase intention.
- Furthermore, we can see that the people around us impact our decisions. Therefore, environmental literacy will help society rather than just one individual. People oversee the consumption habits in which we live. Our attitudes and perceived behavioral control are influenced by the people we live with. This can be linked with demonstration effect.

Future research could investigate the other psychological factors toward purchasing an electric vehicle. In the future, we can add more factors or investigate any mediation effect between these factors. Increased sample size resulted in more generalized results and findings. Hence the study can be extended further to include more states of India in future research.

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