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A Comparative Study on Consumer Satisfaction Regarding EV vs Petrol Vehicle Owners in Ahmedabad City

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A B S T R A C T

This study explores consumer satisfaction regarding electric vehicles (EVs) and petrol vehicles in Ahmedabad, India, focusing on key factors such as performance, fuel efficiency, maintenance costs, environmental concerns, and infrastructure availability. Using a survey of vehicle owners, the research compares attitudes towards EVs and petrol vehicles across various demographic groups. The findings reveal that while age has a weak influence on satisfaction levels, other factors like cost-effectiveness, convenience, and infrastructure availability play a more significant role in shaping consumer preferences. Despite increasing awareness of environmental issues, consumers in Ahmedabad show relatively low concern about the environmental impact of petrol vehicles. Moreover, while technological features and environmental friendliness influence satisfaction, infrastructure-related issues, particularly the accessibility of charging stations, remain a primary concern for EV owners. The study also identifies that both economic factors (such as maintenance and fuel costs) and government policies, including incentives for EV adoption, are critical drivers of satisfaction. The weak association between age and satisfaction suggests that strategies for promoting EVs should not be solely age-dependent but should focus on broader demographic groups and practical aspects such as cost, convenience, and long-term savings. The study provides valuable insights for policymakers, automakers, and urban planners in shaping the future of electric mobility in India and other emerging.

INTRODUCTION

The evolution of all the aspects relating to the movement of people and goods in a specified area has increased significantly thanks to global warming, technological advancement, and shifting patterns of consumption(Mala, Vidani, & Solanki, 2016). The present paper aims at examining the satisfaction levels among electric vehicle users and petrol vehicle owners in the City of Ahmedabad, India, illustrating the factors and preferences related to the choice of transportation modes(Dhere, Vidani, & Solanki, 2016).

Electric vehicle demand is spiralling exponentially worldwide(Singh & Vidani, 2016). China, Norway and the United States have seen tremendous growth in the last decade(Vidani & Plaha, 2016). This trend is slowly influencing Indian markets too, as a combination of environmental policies, advanced technology and changing preferences for consumers are nudging them toward cleaner and more efficient transport solutions(Solanki & Vidani, 2016). There is a mileage advantage of electric cars over the petrol cars as saving cost of fuel, lower requirement of maintenance, and also added attribute of pollution curb(Vidani, 2016).

While petrol vehicles are significant in terms of emission source, the market share of these vehicles is huge owing to well-established infrastructure, lower initial costs, and convenience at refueling(Vidani, Chack, & Rathod, 2017). Icaro Silvestre Freitas Gomes et al. in the findings stated that poor options for charging can have a negative impact on consumer experience in holding and using an EV overall(Vidani, 2018). According to Catherine Nirmala J et al. (2023), because of the heavy burden of dependency on imports, India should look for ways to reduce this dependency through encouragement of electric vehicles(Biharani & Vidani, 2018).

Also, the volatility in the global oil market is going to contribute to another push factor: the petrol price(Vidani, 2018). However, Indians becoming more environmentally conscious does not automatically mean they will switch to EVs(Odedra, Rabadiya, & Vidani, 2018). Price parity between EVs and petrol vehicles still remains top in the agenda of deciding buyer behaviour. More importantly, a buyer evaluates the performance aspects, too(Vasveliya & Vidani, 2019).

RESEARCH OBJECTIVIES

- For determining the age and consumer satisfaction toward the vehicle's performance (objective met by question 7 in the questionnaire).
- For determining whether the age of the consumer is related to customer satisfaction of driving range for electric cars or fuel efficiency for petrol cars (objective met by question 7 in the questionnaire).
- For testing the ease where one can find a refueling or charging station, about being relevant or not about the consumer's age (objective met by question 8 in the questionnaire).
- To evaluate the effect of age on consumer satisfaction with regard to time to refill or recharge the vehicle (objective achieved with question 8 of the questionnaire).

- To evaluate age effect on consumers' opinion regarding the cost of the maintenance of the vehicle (objective achieved with question 9 of the questionnaire).
- To evaluate whether there is an association between age and the consumer's perception concerning the daily running cost of the vehicle fuel or electricity (objective achieved with question 9 of the questionnaire).
- To determine if age is related to the concern about the environmental effect of petrol vehicles (objective attained in the questionnaire question 10).
- To investigate the impacts of age on consumer preference for electric vehicles being more environmentally friendly, (objective achieved from the questionnaire question 10).
- To examine the relationship between age and a person's satisfaction with the technological aspect of the vehicle.
- To understand the age effect on consumer belief about electric vehicles as the future of personal transportation (objective accomplished in Q11 of the questionnaire).
- To measure how age affects overall satisfaction with current vehicle ownership (objective accomplished in Q12 of the questionnaire).
- To determine the relationship between age and intended future purchase of electric vehicles (objective accomplished in Q12 of the questionnaire).

This will further check how age had an impact on opinions in relation to improvements that would be made to charging infrastructure for electric vehicles in Ahmedabad- Question 13 of the questionnaire.

LITERATURE REVIEW

1. Introduction to Electric Vehicles and Consumer Satisfaction

This tremendous growth of EVs on roads across the world has given birth to an extensive literature focusing on the same - to understand consumer behaviour, satisfaction, and preferences(Sachaniya, Vora, & Vidani, 2019). Of late, it is being compared whether electric or petrol vehicles are better for consumers(Sachaniya, Vora, & Vidani, 2019). Many studies have been carried out that focus on factors that influence consumer satisfaction in performance, convenience, environmental benefits, and economic viability(Vidani, Jacob, & Patel, 2019). All these, including poor infrastructures, high initial costs, and policy problems, make the Indian context more challenging(Vidani, Jacob, & Patel, 2019).

The basis of the push to India switching from petrol and diesel engine cars to electric cars is not only because of the perception of environmental risks but also a strategic necessity in terms of de-addiction of oil imports(Vidani J. N., 2016). Recent studies by Bansal et al. (2021) and Kenneth Michael et al. (2022) unveiled that consumer purchase intentions toward electric vehicles are largely driven by exogenous factors rather than the endogenous ones(Vidani & Singh, 2017).

2. Consumer Willingness to Pay for Electric Vehicles

An Indian market-based research by Bansal et al. (2021) pointed out the fact that the willingness to pay for EVs among Indian consumers depends on some attributes, consisting of charging time, driving range, and cost per kilo meter of operating for the vehicle(Vidani & Pathak, 2016). In fact, the hybrid choice modeling approach resulted in fairly reasonable estimates of consumer willingness to pay(Pathak & Vidani, 2016). It was ultimately concluded that Indian consumers would be willing to pay an additional US$ 10–34 to save one minute in fast-charging time, US 7–40 to garner an extra kilo meter in driving range, and US 104–692 to save US 1 per 100 kilo meters pertaining to the operating cost(Vidani & Plaha, 2017).

This study, in greater detail, wants to discuss the fact that Indian consumers have been highly enthusiastic to adapt electric vehicles; however, they largely prefer electric vehicles based on their utility factors, particularly on grounds of driving range and operating cost(Vidani J. N., 2020).

3. Role of Charging Infrastructure and Policy Support

Icaro Silvestre Freitas Gomes et al. (2024) have recognized the points pertaining to the challenges that might be associated with electric vehicle charging and how advanced rate designs might be in helping to evolve consumer experience, which may even bring the solution of submetering so that consumers can get EV-only rates without installing a separate meter and that will allow more efficient charging of EVs without costing much on consumers and avoiding costly reinforcements on the grid(Vidani J. N., 2018).

Public charging stations in the Indian context are basically integrated into development to enhance customer satisfaction(Vidani & Dholakia, 2020). The government of India has even initiated a scheme known as FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) by which electric vehicles can even avail subsidies and further increases the country's EV charging network(Vidani, Meghrajani, & Siddarth, 2023). But the charging stations are still missing in most cities, and that does not contribute to the convenience and practicality associated with owning electric vehicles, a report of Kenneth Michael et al. wrote in the year 2022(Rathod, Meghrajani, & Vidani, 2022).

4. Performance and Technological Advancements in Electric Vehicles

Technological advancement of the components of electric vehicles-either specifically electric motors or batteries for that matter- is most likely to boost the satisfaction of the consumers(Vidani & Das, 2021). There are several categories of electric motors compatible with electric vehicles which include induction motors (IM), brushless DC motors (BLDC), permanent magnet synchronous motors (PMSM) and switched reluctance motors (SRM), among others, as noted in the detailed analysis by Krishnamoorthy and colleagues (2024) (Vidani J. N., 2022). The three types among these group differ in efficiency, cost and dependability index which is a factor in consumer satisfaction(Saxena & Vidani, 2023). The motor is the point of primary performance for an EV as it is force, which makes the vehicle move and thus

decides the speed, torque, and in essence the whole driving experience(Vidani, Das, Meghrajani, & Singh, 2023). Krishnamoorthy et al. (2024) mention that SRM has shown promise so far in reliability and fault tolerance besides a zero-magnet configuration for electric vehicle applications(Vidani, Das, Meghrajani, & Chaudasi, 2023). However, simultaneously, the study also enlightens on some of the existing drawbacks of SRMs including torque ripples that further affect the ride quality(Bansal, Pophalkar, & Vidani, 2023).

5. Environmental and Economic Considerations

Critical features involve boosting consumer satisfaction with electric vehicles components and technological development of the components particularly electric motors and battery technology(Chaudhary, Patel, & Vidani, 2023). Krishnamoorthy et al. (2024) in their detailed review say that categories of electric motors used in the electric vehicle are IM, BLDC, PMSM, and SRM(Patel, Chaudhary, & Vidani, 2023). Anyways, all sorts of motors have pros and cons-advantages in the aspect of energy efficiency, cost, and reliability which come in direct relation with the consumer's satisfaction(Sharma & Vidani, 2023).

Its motor completely defines the performance of an electric vehicle since it is the source of power providing thrust force responsible for its velocity, torque, and general feeling behind the wheel. Krishnamoorthy et al. (2024) have mentioned that switched reluctance motors can effectively be used in electric vehicle applications along with advantages such as reliability, fault tolerance, and a magnet-free structure(Sharma & Vidani, 2023). Therefore, the other shortcomings of SRMs, which are still open issues in the light of the performed study, especially torque ripples, will affect the drive's smoothness(Mahajan & Vidani, 2023)(Saxena & Vidani, 2023).

RESEARCH GAP

The research gap in the study titled "A Comparative Study on Consumer Satisfaction Regarding EV vs. Petrol Vehicle Owners in Ahmedabad City" chiefly pertains to the absence of empirical works that measure the level of satisfaction among the users of electric vehicles and those who use petrol vehicles in an Indian city. Though consumer satisfaction with EVs and the related research is gaining more traction in the world, especially in developed nations, such research looking at cities of India, Ahmedabad in particular is scanty. The gap is even more felt considering the demographic, economo-geographic and other sociocultural variables that experts argue play a role in shaping consumers in this country. The context of India presents both interesting and challenging elements with its diverse population of consumers, some who have low awareness and a more complex legal framework that could be drastically different than those in western countries where EV applications are embraced to a far advanced level. Plus, the few existing literature on satisfaction levels among vehicle users in India have either centered on users of vehicles reliant on petrol or electric powered vehicles but made no comparisons between the two sets. This demonstrates a huge research opportunity to

evaluate measures of consumer satisfaction levels between the two types of vehicles in the same city.

Another significant limitation is the lack of adequate investigation into the compelling determinants of satisfaction or dissatisfaction among drivers of electric vehicles compared to that of petrol vehicles. The majority of existing literature gives wide ranging parameters such as ownership cost, fuel economy, green house gas emission reduction, and similarity in features, and does not seek to understand the finer aspects that impact satisfaction in the Indian context like subsidies by the government, access to charging points, maintenance costs, and support services.

Ahmedabad in particular is an interesting example given its advancing position on the sustainable transportation landscape of India, with the help of government support, infrastructure provisions such as public charging stations, and general environmental consciousness. Nevertheless, it is still not obvious how these very local contextual factors influence consumer satisfaction in relation to petrol vehicle owners. For example, it is possible that on the one hand, EV owners rejoice at the good cause they support, but on the other hand, they are frustrated because of the few charging stations or the re-fueling process which seems longer than normal. In contrast, an owner of a petrol vehicle has the advantage of an easy to use vehicle but suffers with other issues such as expensive fuel and the undesired effects of using such vehicles in the future.

Moreover, there are no studies which focus on certain demographic constructs such as age, income, education and awareness levels in regard to consumer satisfaction among urban dwellers in Ahmedabad. For instance, it is possible that the younger generation that has an interest in the environment may view purchasing an EV more as an ideology than as a vehicle for transport as older and conservative consumers may do as they are likely to embrace don't care attitude about pollution caused by petrol cars. If no analysis tackles this specific demographic, tendencies and trends in consumer behaviour will fall short of important perspectives usable by both the authorities and manufacturers of cars. More so, given the current EV market in India which is heterogeneous with new models, technologies and prices coming up, research on consumer satisfaction should be longitudinal as opposed to cross-sectional.

The increasing development of EVs and petrol vehicles calls for an understanding of how consumer satisfaction trends as these technologies grow and how this affects the user experience and future adoption.

Thus, this study attempts to contribute to the existing literature through comparative research on consumer satisfaction in Ahmedabad considering both EV and petrol vehicle owners and how local infrastructure, demography and market dynamics influence the variations in levels of satisfaction.

HYPOTHESIS

1. There is a significant association between Age and whether my vehicle's performance (acceleration, speed, etc.) meets my expectations.

2. There is a significant association between Age and satisfaction with the driving range (for EVs) or fuel efficiency (for petrol vehicles) of my vehicle.
3. There is a significant association between Age and the ease of finding a refueling station (for petrol vehicles) or charging station (for EVs) in Ahmedabad.
4. There is a significant association between Age and the perceived reasonableness of the time required to refuel my petrol vehicle or charge my EV.
5. There is a significant association between Age and the affordability of the maintenance cost of my vehicle.
6. There is a significant association between Age and satisfaction with the daily operating cost (fuel/electricity) of my vehicle.
7. There is a significant association between Age and concern about the environmental impact of petrol vehicles (air pollution, emissions).
8. There is a significant association between Age and preference for EVs due to their environmental friendliness.
9. There is a significant association between Age and satisfaction with the technological features (navigation, connectivity, etc.) of my vehicle.
10. There is a significant association between Age and the belief that EVs represent the future of personal transportation
11. There is a significant association between Age and overall satisfaction with my current vehicle.).
12. There is a significant association between Age and the likelihood of considering buying an EV (for petrol vehicle owners) or another EV (for EV owners).
13. There is a significant association between Age and the belief that the charging infrastructure for EVs in Ahmedabad is improving.

Table 1: Validation Of Questionaire

Statements	Citation from JV citation file (You can add more than 1 citation)
My vehicle's performance (acceleration,speed,etc) meets my expectations	(Vidani & Solanki, 2015)
I am satisfied with the driving range (for EVs) or fuel efficiency (for petrol vehicle) of my vehicle	(Vidani, 2015)
It is easy to find a refueling station (for petrol vehicle) or charging station (for EVs) in Ahmedabad	(Vidani, 2015)
Time required to refuel my petrol vehicle or charge my EV is reasonable	(Vidani, 2015)
The maintenance cost of my vehicle is affordable	(Solanki & Vidani, 2016)
I am satisfied with the daily operating	(Vidani, 2016)

cost(fuel/electricity) of my vehicle	
I am concerned about the environmental impact of petrol vehicle (air pollution,emission)	(Bhatt, Patel, & Vidani, 2017)
I prefer EV because they are environmentally friendly	(Niyati & Vidani, 2016)
I am satisfied with the technological features(navigation, connectivity,etc) of my vehicle	(Pradhan, Tshogay, & Vidani, 2016)
I believe EV represent the future of personal transportation	(Modi, Harkani, Radadiya, & Vidani, 2016)
I am satisfied with my current vehicle overall	(Vidani, 2016)
In the future i would consider buying an EV (for petrol vehicle owners) or another EV (For EV owners)	(Sukhanandi, Tank, & Vidani, 2018)
The charging infrastructure for EV in Ahmedabad is improving	(Singh, Vidani, & Nagoria, 2016)

**Source: Author's compilation*

METHODOLOGY

Table 2: Research Methodology

Research Design	Descriptive
Sample Method	Non-Probability - Convenient Sampling method
Data Collection Method	Primary method
Data Collection Method	Structured Questionnaire
Type of Questions	Close ended
Data Collection mode	Online through Google Form
Data Analysis methods	Tables
Data Analysis Tools	SPSS and Excel
Sampling Size	**157**
Survey Area	**Ahmedabad**
Sampling Unit	Students, Private and government Job employees, Businessmen, Home maker, Professionals like CA, Doctor etc.

**Source: Author's compilation*

DEMOGRAPHIC SUMMARY

The demographic overview of the sample has presented us with quite a heterogeneous batch of respondents. In terms of age, the majority (59.2%) is

aged between 18 to 25 years, followed closely by the 26 to 35-year age group at 20.4%. With respect to gender, there are more male (61.8%) than female (38.2%) respondents. Most respondents were well educated, with the highest number being postgraduate (36.3%), followed by those with an undergraduate (28.7%) and a doctorate (15.3%) degrees. In terms of annual income, a majority (51.6%) earns below 3 lakhs while fewer people earn more than that. A large section of respondents also owns petrol vehicles (66.2%), whereas a similar percentage of respondents owns electric vehicles (20.4%), and respondents own both types of vehicles, i.e. petrol and electric vehicles, is 13.4%. Last but not least, most respondents have had the same vehicle for 1-3 years (52.2%), however most of respondents did not state the length of time they have owned that vehicle (85.4% missing value).

CRONBACH ALPHA

Table 3: CRONBACH ALPHA

Cronbach Alpha Value	No. of items
0.825	13

**Source: SPSS Software*

A Cronbach's Alpha score of 0.825 for 13 items on a measurement scale shows a good degree of internal consistency or reliability of the measurement scale. The Chronbach's Alpha is a coefficient that can range between 0 and 1, where high figures indicate that the items within the scale are measuring the same thing in a more efficient manner. A value of 0.825 is usually rated anywhere from acceptable to good, which means that the 13 items are inter-correlated enough to yield significant results. Which in practical cases implies that the scale in question can be relied upon to measure the concerned variable.

TABLE 4: RESULTS OF HYPOTHSIS TESTING

Add rows as per number of hypothesis you have created

Sr. No	Alternate Hypothesis	Result p =	>/< 0.05	Accept/ Reject Null hypothesis	R value	Relationship
H1	There is a significant association between Age and whether my vehicle's performance (acceleration, speed, etc.) meets my expectations.	0.148	>	H01 Accept (Null hypothesis rejected)	0.366	Weak
H2	There is a significant association between Age and satisfaction with the driving range (for EVs) or fuel efficiency (for petrol vehicles) of my vehicle.	0.019	<	H02 Rejected (Null Hypothesis Accepted)	0.951	Weak
H3	There is a significant association between Age and the ease of finding a refueling station (for petrol vehicles) or charging station (for EVs) in Ahmedabad.	0.392	>	H03 Accept (Null Hypothesis rejected)	0.188	Weak
H4	There is a significant association	0.012	<	H04	0.404	Weak

	between Age and the perceived reasonableness of the time required to refuel my petrol vehicle or charge my EV.			Rejected(Null Hypothesis Accepted)		
H5	There is a significant association between Age and the affordability of the maintenance cost of my vehicle.	0.359	>	H05 Accepted(Null Hypothesis Rejected)	0.594	Weak
H6	There is a significant association between Age and satisfaction with the daily operating cost (fuel/electricity) of my vehicle.	0.006	<	H06 Rejected(Null Hypothesis Accepted)	0.338	Weak
H7	There is a significant association between Age and concern about the environmental impact of petrol vehicles (air pollution, emissions).	0.005	<	H07 Rejected(Null Hypothesis Accepted)	0.505	Weak
H8	There is a significant association between Age and preference for EVs due to their environmental friendliness.	0.134	>	H08 Accept(Null Hypothesis Rejected)	0.404	Weak
H9	There is a significant association between Age and satisfaction with the technological features (navigation, connectivity, etc.) of my vehicle.	0.073	>	H09 Accept(Null Hypothesis Rejected)	0.292	Weak
H10	There is a significant association between Age and the belief that EVs represent the future of personal transportation	0.363	>	H010 Accept(Null Hypothesis Rejected)	0.436	Weak
H11	There is a significant association between Age and overall satisfaction with my current vehicle.). .	0.022	<	H011 Rejected(Null Hypothesis Accepted)	0.825	Weak
H12	There is a significant association between Age and the likelihood of considering buying an EV (for petrol vehicle owners) or another EV (for EV owners).	0.038	<	H012 Rejected(Null Hypothesis Accepted)	0.741	Weak
H13	There is a significant association between Age and the belief that the charging infrastructure for EVs in Ahmedabad is improving.	0.157	>	H010 Accept(Null Hypothesis Rejected)	0.157	Weak

**Source: Author's compilation*

DISCUSSION

This research grapples with the issue of electric vehicles (Evs) with regards to consumer satisfaction in Ahmedabad as compared to petrol vehicles,

which is very useful, however, more research can be done to cover other aspects that affect vehicle ownership and consumer behaviour in emerging markets. The following recommendations illustrate possible directions for future research and how the aim of this study could be increased in scope: However, further analysis has provided proposal for additional research in the following ways:- 1. Incorporating a Larger and More Diverse Sample This research used vehicle owners in Asmara, a dynamic city in India as the unit of study. In order to grasp different facets of consumer behaviour, the future studies can provide a sample from several cities in India or from other less developed markets. A wider geographic extent would make it possible to draw a wider range of consumer characteristics found in different places and even among urban centres and rural areas with different levels of income, infrastructure development, and environmental literacy. Comparison of the respondents' preferences by regions, urbanization levels, or even states would help in determining the effect of geographical factors on vehicle ownership preferences.

1. Incorporating a Larger and More Diverse Sample

This research will emphasize more so the vehicle owners in the city of Ahmedabad, which is amongst the fastest growing urban centers in the country of India. In order to enhance understanding of consumer behavior, for instance in the case of travel, further research could include a larger population sample of several Indian cities or still other developing markets. Such extension would lead to addressing a wide range of consumers incorporating both urban and non urban areas with differing degrees of development, income and ecological consciousness. One more interesting approach would be painting similar pictures from different perspectives – intra-regional, urban versus rural, or even inter-state comparison which could show potential for variations in vehicle preferences due to different regions and their characteristics.

2. Longitudinal Studies on EV Use

Since the acceptance of electric vehicles is still at a growing period in most of the developing countries, consumer attitudes and satisfaction with time, therefore, longitudinal studies may be helpful. Future research might consider how consumer attitudes converge and diverge during the process of adoption of EVs – as the infrastructures develop and the enabling policies enhance. A longitudinal approach could also consider the role played by improvements in technology (say batteries, charging speed, etc.) on the comfort and willingness of consumers to embrace EVs.

3. Understanding Social and Peer Pressure's Role

While this research mainly concentrated on various demographic indicators, including analysis of age and satisfaction, it is likely that there could be social aspects in consumption decision behaviours. There could be a more in-depth understanding of the outcomes of peer group, social media and other interventions in the way consumers perceive Ettv and petrol vehicles and the way they interact with each other. People's views or concern for their peers may

affect their decision to purchase certain products, especially vehicles in a nation such as India that has relatively high social ties. Looking at how vehicle purchasing behavior is affected by a social group or community entity can extend understanding of the issues of vehicle ownership more deeply.

4. Exploring Psychological and Emotional Aspects

Further research might include additional inquiry into how psychological and emotional aspects determine satisfaction for consumers of both EVs and petrol vehicles. For instance, the joy one gets from operating a 'clean green' automobile, the 'green' image that comes with owning an EV, or the desire for a more sustainable world may all go a long way in informing consumer decisions that are not merely practical in nature. Psychological variables such as environmental self, value system, and adoption of new technology will be approached through the lens of social psychological and theories of consumer behavior. Exploring the reasons behind adoption of EVs which tend to be emotional reasons will assist the marketers and manufacturers in developing their communication strategies in a manner that addresses the needs of the consumers effectively.

5. Policy Shift's Effect on the Behavior of Consumers

Activities and consumer behavior activity include sponsorship programs such as encouraging consumers through government policies. Such policy interventions aid in accelerating ev uptake. In future research, trends in perceptions and drivers along the continuum of socio-economic segments can be examined relative to the impact of different types of policies on consumers. For example, how would consumer behavior be affected among different levels of income when subsidies are directed towards the purchase of EVs alone or the overall purchase of the vehicle? This would be a very useful finding for both the policymakers and businesses. In studies, the effects of the policies could also be examined, but in this case focused on the time period after intervention and especially on consumer satisfaction and dynamics of the market of electric vehicles.

6. Preference of Heterogeneous Towards Hybrids and EVs

The current study focused on the differences between electric vehicles and gasoline motor vehicles only, however, further research may enhance the study by adding hybrid cars in the assessment. Hybrid cars, which feature an electric motor and an internal combustion engine, are fast gaining acceptance in most markets as they incorporate the merits of both petrol vehicles and electric vehicles. This leads to a rich understanding of issues related to how people view the degree of satisfaction attained when using hybrid vehicles to that of gas driven cars and electric vehicles. Research can also turn on how consumers assess the merits of having low running costs with EVs but at the same time the running ease of hybrids especially in regions with poor or no charging infrastructure.

7. Examining Barriers to Positive Attitude Towards EV Acquisition Beyond Cost

Future studies should abandon the current trend of concentrating on the cost factor only and assess more on the impediments such as inconvenience, ignorance about E.V technology and the range/charging time. Cost is one of the factors that concern most consumers, non-financial issues can deter a large number from adopting the technology. There are many such studies that examine the impact of consumer education, awareness, and the effect of the information on overcoming the barriers. It would be good to know how to deal with such issues in practice, as it can help in enhancing the satisfaction of the clients and supporting the shift to the green transport system.

8. Consequences of Electric Car Possession on the Way of Life of Individuals and City Transportation

Another possible approach that can be explored in future studies is the effect that consumers, and consequently the society as a whole, have on the changing patterns of ownership of an electric vehicle. Car owners then may tend to change the way they travel, as in combining and using other forms of transportation, such as public trains and buses, sharing a car with different individuals, or using other means of transport services such as Uber or Lyft. Further studies could investigate the required lifestyle changes when an individual is an electric vehicle owner besides the main form of transportation – the vehicle itself, e. g. bicycles, e-scooters, subways, buses. Such research would help understand the place of electric vehicles within other initiatives fostering sustainability in cities and planning urban movements.

9. Seen in the Light of E-Mobility – Expected Research Developments in the Context of EV Charging Technology

It would be interesting to address within future research how innovative external factors in terms of technology advancements affect the satisfaction of customers or willingness to accept the charges. There has been quite a change in the charging ecosystem of electric vehicles. Technologies such as fast charge stations, wireless charge, and smart grid and electric vehicles integration will enhance the benefits of owning an electric vehicle. It would be important to appreciate how these innovations are viewed by the consumers and how do they influence the level of satisfaction, as it may aid in developing better advanced infrastructure in the future.

CONCLUSION

In conclusion, this study has paved the path to understanding consumer satisfaction towards electric versus petrol vehicles in Ahmedabad but further research can be dominated. Completing further research in these areas will help in broadening understanding on the factors that influence vehicle ownership in developing countries. This is because the research will look into other genera, historical patterns, and sociocultural aspects, as well as infrastructure and policy issues, within these countries. Such an understanding will be necessary

to attain the objectives of this study as pertinent policies will have to be developed on how to deal with the transition.

RECOMMENDATIONS FOR FUTURE RESEARCH/ FUTURE SCOPE OF THE STUDY

This study examines consumer satisfaction towards electric vehicles (EVs) and petrol vehicles in the context of Ahmedabad, thereby offering greater depth its analysis. There are still many more factors to consider addressing vehicle ownership and consumption patterns especially in emerging economies that require further research. The ensuing recommendations detail what aspects of the study could be addressed more thoroughly and introduced novel lines of trail research:

1. Sample Expansion in Terms of Size and Diversity

This study concentrated on vehicle owners from the city of Ahmedabad which is among the major growing metropolitan cities in India. To better understand the consumers, perhaps future researches will change the focus to more than one town or even several emerging economies. The wider geographic scope would target to a wider range of consumers including urban and rural areas with different levels of development, incomes, and attitudes towards the environment. Because of this it's possible to conduct comparative analysis of data groupings in terms of their geographical regions, or the distinctions between urban and rural populations, or even between different states to assess the significance of other regional preferences in car ownership.

2. Longitudinal Studies on EV Adoption

This may not be the case in most developing countries where incarnation of electric vehicles is still yawning stages hence longitudinal studies would come in handy in holding the change in consumers' attitude and satisfaction over time. Future research could advance on understanding consumer perspectives on the evolution of Evs' market adoptions including the infrastructure, policies in place and the rate of adoption over time. A longitudinal approach could also look into how battery life and charging speed advancements change customer satisfaction and the propensity to use EVs among new users. Such shifts in needs are caused by varying infrastructure development, policies, and technologies over time, understanding this evolution will assist in predicting the target and future of EVs adoption in India.

3.Socio-Cultural Aspects and Networks: An Overview

Geographically, this study initially focused more on individual factors such age and level of satisfaction. However, this is not to say that social factors are of no importance. Further studies may research the impact of peer groups, social media and even word of mouth in developing and enhancing attitude towards EVs as well as gasoline cars. Social factors in the form of social expectations, status perception and even other aspects such as friends and family circles can influence the buying behavior of cars, more so in a country such as India where these social ties are knitted into the society. Further, a

consideration of the role of social groups or community networks in consumer behavior may provide an even better understanding of the different social factors that shapes vehicle ownership.

4. Psychological and Emotional Factors as Topics of Research Questions

The psychological and emotional issues of why consumers are satisfied or dissatisfied with EVs and petrol cars are areas that should be considered in future research. In the instance, for instance, the happiness which a person feels when riding on an environmental friendly car, status associated with owning an electric vehicle and psychosocial aspects like worries about the future may influence the choices of such consumers even further than the usage aspects. Environmental self and environmental values as well as pro-environmental attitude toward innovative solutions can be one of the social-political concepts centered on seventy five percent femininity in relationships and consumer behavior. If policymakers and manufacturers would want to be effective in formulating strategies for marketing electric vehicles, which would appeal to customers, expectations concerning these aspects of emotions have to be met.

5. The Effects of Changes in Policies on Consumer Behaviours

In order to hasten the adoption of electric vehicles, government policies such as the purchase subsidies on electric vehicles, tax rebates and incentives for green technologies must be in place. An interesting avenue for future research would be to see how different types of policies mediate consumer perceptions and purchase behaviors in heteromorphic social/ economic strata. For example, the effect of specific subsidies for electric vehicles like the EV CAAP or depreciation measures on the consumer attitudes and behaviour towards switch to electric cars in income different segments could serve useful purposes to governments and industrial players alike. In addition, such research could investigate the possible time lags between the implementation of certain policy measures and associated changes in consumer behaviour e.g. in relation to the abolition or reduction of subsidies for certain products and consumer satisfaction with their purchase and sales growth of such products in the case of the EVs market.

6. Hybrid And Electric Vehicle Preference Comparisons

This research considered electric vehicles as an upgrade over petrol vehicles; future comparisons could include a hybrid vehicle as well. This is primarily because hybrid vehicles, which use the internal combution engines as well as an electric power, are favored in various markets since they give all the advantages cntered around petrol and electricity. On this note, research on satisfaction with hybrid vehicles as opposed to petrol cars of the same design, and fully electric cars, can give meaningful coverage of a progressive phase of ownership of the respective vehicle class. Research might look at the idea of why the consumer balances the less expensive to operate costs of an EV with a hybrid, particularly in a country that does not have adequate charging systems.

7. Exploring Other Factors Discouraging EV Purchases Other Than Cost

It is suggested that future scholarship pay attention to the non-economic aspects of EV penetration like the "inconvenience" question, the knowledge deficit about EV technology and fear of range/changing time, and so forth. Although cost is one of the primary concerns for the majority of people, especially the ones interested in buying electric vehicles, the non-financial ones could potentially slow down the adoption rates even more. This research could examine educational programs for consumers, outreach strategies and the information where its most needed, or all of the above and evaluate how these addressed the problems. It may also go a long way in enhancing consumer satisfaction and quickening the pace towards sustainable transportation through understanding the appropriate measures to employ in tackling such blockade.

8. Ownership of Electric Vehicles and Their Effects on Daily Activities and Mobility in the City

Another direction in which research can be extended in the future is the impact of owning an electric vehicle on the consumers' lifestyle and the way they move within the city as a whole. The behaviors of EV owners may also include a greater share of public transport use, car sharing or the use of some additional mobility services. It may also research how the ownership of an EV affects other direct behaviors related to urban mobility, such as who uses other modes of sustainable transport, which include bicycles, e-scooters, or buses. This will shed light on how the integration of EVs into the transportation network can be embraced as part of a bigger peace in sustainability puzzle.

9. The growing importance of EV charging technology – The research excludes non-innovations.

Any foresight studies, however, may suggest the consideration of other issues such as the EV charging technology itself, which has been improving targeting for consumer satisfaction and adoption. Producing along with the emerging chain of charging stations for electric cars, advanced charging means and inventions such as sheer fast charging, wireless charging, and smart grid connectivity will surely aid one's possession of an electric car. More fascinating would be the very fact how in these composites do the users put emphasis on such advancement and does it aids their satisfaction where in such cases such elements will enhance the future models of infrastructures more consumption prone.

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