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Role of Perceptual Belief on Purchase Attitude of Public Towards Electric Vehicles: Evidence from Emerging Market

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ABSTRACT

Electric vehicles are playing a major role in cutting the emissions that is creating a serious impact on atmosphere. They are contributing to the sustainable development. It is necessary to measure the perceptual belief of the people about Electric vehicles, understand the awareness of people about electric vehicles, identify the purchase attitude and the role of grants provided by the government on purchase attitude.Therefore, the present study aimed at understanding the role of perceptual behaviour on the purchase attitude of the public towards electric vehicles. 100 questionnaires were collected from the public and the perceived belief and the purchase attitude was measured, compared and analysed using Correlation. The role of grants provided by the government for EV adaptation and its effects on the purchase attitude was analysed using Anova. The study showed that there is less relation between perceptual belief and the purchase attitude of the people towards EV and Grants and subsidies provide do not influence the purchase attitude highly. The perceptual belief and the role can be understood through the findings of the study.

Key words – Perceptual belief, Electric vehicles, Purchase attitude

1. INTRODUCTION

India is lambasted as the world's third highest polluter in 2019 (Sunita Narain, Down to earth), and its scale of emissions, 2.88 CO2 gigatons (Sunita Narain, Down to earth) and emissions this is creating a serious impact on atmosphere and ozone layer.

A petrol engine set up in a format to run on petrol (gasoline) and similar volatile fuels is an internal combustion engine. The carburettor premixes the fuel with the air, in some cases premixed by electronically controlled fuel injection emits around 4.6 metric tons of Co2 (EPA United States Environmental protectionAgency)around a year. Apart from Co2 some

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hydrocarbons oxides of nitrogen and particulate matter that can lead to smog creation which also creates serious health impact. Electronic vehicles (EV) use energy stored in batteries and thereby using the stored energy and electric engines propels the vehicle. EVs are silent and lower emissions are only there. Doubling the 2020 sales around 6.6 million plug-in electric cars were sold in 2021 thus achieving 9% market share of the global new car market (Stephen Edelstein). With the current depletion of fossil fuels and its price hike, there is a need for another energy resource to run the vehicle. The automobile sector is considering Electric Vehicle as a solution to the industry and environment in India. However, the current market penetration of EV is relatively low in spite of governments implementing EV policies. Through this paper potential attitude of people resulted by perceptual belief on Electric vehicle in India will be studied. Different perceptions are developed by the people in India regarding Electric vehicles and the people are not keen to understand the actual uses, merits and demerits of the EVs. Different misconceptions are there in the minds of the people related to electronic vehicles. So here the perceptions of the people are evaluated and is these perceptual beliefs having role on the purchase attitude of the public towards electronic vehicles are identified. India is dependent upon oil imports and most of the vehicles run on petrol and diesel. This paves a way to the most of the pollution in a country like India. An alternative is required to be introduced and the best available in the markets is the electric vehicles.

The research questions kept forward were:

• Is perceptual belief affecting the purchase attitude towards electric vehicle?

• Does this perception is giving a dominance to petrol vehicles over electric vehicles?

Objectives of the research

• To measure perceived belief of people about Electric Vehicle.

• To identify the role of perceptual belief on purchase attitude.

• To identify if there is any relationship between the grants or subsidies provided for EV s by government and the purchase attitude of the people.

2. REVIW OF LITERATURE

Several studies attempted to investigate theconsumers' adoption of battery electric vehicles (BEVs) using socio-cognitive perceptions and socio-demographic moderators in an emerging sustainable mobility market. Findings showed the link between social-cognitive perceptions-attitude-intention with the moderation of socio-demographic variables and mediation of attitude towards BEV.(Deepak Jaiswal Vikrant Kaushal, Arun Kumar Deshmukh, Rishi Kant,

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Pradeep Kautish. 2022). Different studies aimed analyze the impact of environmental concerns on consumers' attitudes toward and intention to purchase EVs.The research findings indicated that environmental concern plays a notable influential role in the attitude toward and intention to purchase EVs. (N Tunçel, EB Buğday 2022). Another research explored the role that media and other communication channels writing about EVs played in consumer perceptions and awareness of government-initiated programs and policies to incentivise EV market transition. The study identified car buyer's use media to update knowledge about cars, perceptions about EVs, and likelihood to buy, and tested awareness and popularity of incentives.(Gail Helen Broadbent Thomas Oliver, Wiedmann Graciela Isabel, Metternicht. 2021). Electric Vehicle knowledge and the purchase intention was analysed in different researches. (Jaiswal, Deepak & Kant, Rishi & Singh, Pankaj & Yadav, Rambalak. 2021), (VV Krishnan, BI Koshy 2021), (VH Pradeep, VT Amshala, BR Kadali 2021) (F Ye, W Kang, L Li, Z Wang 2021). Studies were conducted to measure the impact of home-location based spatial characteristics and individual characteristics of BEV in regions without strong policies. These studies revealed that BEV adoption is impacted by one's affinity to technology, income and green party preferences.(GraciaBrückmann, Fabian Willibald,VictorBlancoac 2020). Another research looked into the problems that India has in adopting electric vehicles (EVs) by 2030 and concluded to the findings that sharing utility and public economy plays in major role in the promotion and adaptation of EV. (Kumar, R., Jha, A., Damodaran, A., Bangwal, D., & Dwivedi, A. (2020).Another research was carried out to better understand the sociotechnical nexus of EV barriers to adoption in the Nordic countries and found out that the barriers are closely linked to the knowledge of customers and customer experience. (Noel, L., Zarazua de Rubens, G., Kester, J., &Sovacool, B. K. 2020). Some studies adopted a model using two theoretical models: The Norm Activation Model and the Theory of Planned Behaviour. According to the findings, consumers' choices were influenced by perceived value, attitude, attribution of responsibility, subjective norms, personal norms, perceived consumer effectiveness, and awareness of consequences. (ShahlaAsadi, MehrbakhshNilashi, Sarminah Samad, Rusli Abdullah, Marwan Mahmoud, Monagi H. Alkinani, ElahehYadegaridehkordi 2020).

Research Gap

From the literatures gone through, most of the studies covered the perception on EV among citizens out of India and the latest reports states that the affinity of Indian citizens towards electric vehicles is low and it covers on 0.2% of the overall automobiles. This study concentrates on Indian citizens to identify their perception belief that affects the purchase attitude towards electric vehicles thus helping the industry to concentrate on their marketing strategies.

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3. THE RESEARCH MODEL

The research model is supposed to measure the perceptual belief of the people and compare it with the purchase attitude of the people, questions related to the awareness of people regarding electric vehicles were developed and it included questions related to security features, comfort, battery quality, accessory quality, environmental hazard it produced, eco-friendly concerns, mileage, charging stations etc. By using structured questionnaire, the perceived belief was investigatedfrom 100 respondents living in different cities in Kerala and it was measured and compared with purchase attitude. The study also evaluated the role of grants provided by the government to purchase Electric vehicle does really inspire the people to purchase. The research design assists the researcher to define the study of population, selection of a suitable measuring instrument and suitable statistical techniques for data analysis. This study undertook descriptive research design by convenience sampling as influenced by the nature of research problem. This is a descriptive study with the help of a questionnaire. SPSS (Statistic Package for the Social Science) was utilized to analyse this study after gathering primary data inputs through a survey with the use of a structured questionnaire. Correlation and One Way ANNOVA are two types of data analysis tools used

H1: Perceptual belief of people are related with purchase attitude of the people.

People have developed some perceptual belief regarding Electric vehicles and this often helps the people to purchase and not to purchase. This nature was evaluated here and the purchase attitude towards electric vehicles were also judged and this was compared here. People have generated their views regarding the peer groups and has just arrived to some conclusions and are the environmental concerns was only the merit which electric vehicles provided was also to be evaluated here.

Ho: There is no significant difference in the attitude of People with regarding to their awareness on subsidies and grants.

The common nature of people attracts some people to the product if some of grants by the government or discounts are provide for the product. So especially in Country like India Grants or subsidies provided by the people attracts people. This is to be ensured and evaluated and the compared to the purchase attitude.

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4. ANALYSIS AND INTERPRETATION

TABLE 4.1CORRELATION BETWEEN PERCEPTUAL BELIEF AND PURCHASE ATTITUDE

Correlations

		PECEPTUAL BELIEF	PURCAHSE ATTITUDE
PECEPTUAL BELIEF	Pearson Correlation	1	.173
	Sig. (2-tailed)		.085
	N	100	100
PURCAHSEATTITUDE	Pearson Correlation	.173	1
	Sig. (2-tailed)	.085	
	N	100	100

INTERPRETATION

The table 4.1 indicates the correlation between Perceptual belief and the purchase attitudeand it is found a low correlation exist between perceptual belief and purchase attitude ($r = 0.173$, $p = 0.085$) failed to reject the null hypothesis. Hence there is no significant relation between Perceptual belief and Purchase attitude. Therefore, it can be inferred that perceptual belief is having no significant role in influencing the purchase attitude of the people.

TABLE 4.2 Perceived belief on EV

The variables used to measure the perceived belief on Electric Vehicle is measured using 5 point Likert scale.

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Descriptive Statistics – Perceived Belief

Variables	N	Mean	Std. Deviation
Electric vehicles are playing a high role in reducing Co2 emissions	100	4.46	.904
Price of electric vehicles is very high compared to gasoline vehicles	100	4.00	1.035
Does environment concerns matter you while purchase	100	3.95	.989
Resale value of the Electric car is lower	100	3.92	.907
Recharging time of the Battery is high	100	3.84	1.012
Refilling time of electricity in electric vehicles is high	100	3.79	1.008
Depreciation of electric vehicles is higher	100	3.70	.927
Chance of battery failure is high	100	3.68	.898
Power specifications of the car is low as that of other normal vehicles	100	3.60	1.035
Government is providing different subsidies on Electric vehicles	100	3.56	1.095
Chances of explosion are high	100	3.55	1.058
Maintenance cost of the vehicles is high	100	3.48	1.087
Battery life of the vehicles is very high	100	3.38	1.153
Post purchase service provided is good	100	3.35	1.048
Torque of electric vehicle is poor compared to gasoline vehicles	100	3.32	1.171
Value and ethical concerns doesn't matter you when you chose for a car	100	3.31	1.237

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Security features provided by electric vehicles are comparatively low	100	3.28	1.147
Quality of accessories in car is poor	100	3.28	1.064
Brands of car launching electric vehicles in India is satisfactory	100	3.24	1.120
Quality of accessories of the car is poor	100	3.22	1.040
Chance of engine failure is high	100	3.16	1.002
Refilling cost is very high	100	2.89	1.230
Availability of recharge stations is high	100	2.78	1.252
Electric vehicles are symbol of luxury	100	2.68	1.180
Valid N (listwise)	100		

INTERPRETATION

The table 4.2 measures the perceived belief of the respondents regarding Electric Vehicle. The results in the table exhibit that majority of the respondents perceives badly about the quality, Price and durability of the attributes of electric vehicles. But most of the respondents perceived positively the role of electric vehicles in cutting CO2 Emissions.

Difference in the purchase attitudeon the basis of awareness on Govt subsidies and grants to EV

To test the relationship between awareness on Govt subsidies and purchase attitude the following hypothesis were formulated.

Hypothesis -$H_0$2: There is no significant difference in the purchase attitude of the people with respect to their awareness regarding the Govt. Subsidies to EV

TABLE 4.3 Govt. subsidies and purchase attitude

	N	Mean	Std. Deviation	Std. Error

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Strongly Disagree	2	7.50	3.536	2.500
Disagree	16	7.13	1.784	.446
Neutral	31	7.19	1.621	.291
Disagree	26	7.81	2.000	.392
Strongly Agree	25	7.64	2.018	.404
Total	100	7.46	1.866	.187

TABLE 4.4Test of Homogeneity of Variances

PURCAHSEATTITUDE

Levene Statistic	df1	df2	Sig.
.535	4	95	.710

TABLE 4.5ANOVA

PURCAHSEATTITUDE

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	7.953	4	1.988	.561	.692
Within Groups	336.887	95	3.546		
Total	344.840	99			

INTERPRETATION

The table 4.5 Shows Sig value of ANOVA 0.692, which is greater than 0.05. Hence, the null hypothesis is accepted. This indicates that, there no significant difference in the purchase attitude based on the awareness on Govt grants to EV. It can be inferred that even if people are aware about government subsidies and grants to encourage Electric Vehicle consumption, this awareness does not have any influence on their attitude towards purchase of EV.

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FINDINGS

- Most of the people badly perceive about the quality, price and durability of the EV.
- There is no significant difference in the purchase attitude of the people with respect to their awareness about Govt subsidies to EV.
- There is no significant relationship between perceptual belief of people and purchase attitude of the people.
- Government subsidies and grants do not influence the purchase attitude of people.
    - Majority of the respondents opined that Electronic vehicles are playing a major role in cutting the Co2 Emission. (mean score – 4.46)
    - Perception of people regarding Price of Electric Vehicles are high compared to Gasoline Vehicles. (mean score– 4.00)
    - People perceived that Resale value of the electric car will be lower (mean score – 3.92)
    - Most of the respondents perceived that Recharging time of the Battery is high. (mean score – 3.84)
- Majority of the respondents opined that they are not considering electric vehicle as symbol of luxury. (mean score – 2.68)

  They are confident about the engine capacity of EV and don't think that refilling cost of EV is high (mean score – 2.89).

CONCLUSION

Climate change and Environmental pollution are the two major concern, facing by the countries all around the world in the present scenario. Lion share of environmental pollution can be attributed to the emission of petrol and diesel vehicles. Production and consumption of Electric vehicle is expected to reduce the emission to a significant extent. Even if government promote and encourage people to buy EV through mass production and subsidies, the consumption of EV is still in nascent stage. Perceived belief and attitude of the people have a major impact on this low consumption. In case of most of the products, perceived belief about the quality, usage and durability of the product plays a significant role in stimulating interest in the consumers to purchase it.

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The result of this studyshows that perceptual belief is having no significant role in influencing the purchase attitude of the people towards electric vehicle. Also the perceived belief of the public towards EV is not good. The subsidies provided by the government is also not influencing the purchase attitude and it does not induce an intention for the people to develop a purchase attitude.So perceptions are not having any role in the purchase attitude and it leads to reach a conclusion that perceptions doesn't matter but proper awareness matters in developing purchase attitude of the people towards Electric Vehicle.

7. Implications and suggestions

Proper awareness regarding EV is to be given to public.Apart from the knowledge that EV s cut Co2 emissions other merits of EV's should be brought to limelight. Number of charging stations should be started. Companies should work on the battery life of EV's.Government should bring better subsidies which attract people. Better EV policy should beadopted.Special Advantages to EV customers should be given by Government.

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