

# **"Investigating the Gender-Driven Moderating Factors in Electric Vehicle Acceptance: Evidence from Chhattisgarh"**

## **Abstract:**

The rapid rise of Electric Vehicles (EVs) has emerged as a critical response to urgent environmental challenges, offering a cleaner alternative to conventional vehicles. By significantly reducing air pollution, mitigating the effects of climate change, and decreasing dependence on fossil fuels, EVs contribute to global sustainability goals. This transition is not only propelled by technological advancements but also by growing consumer demand for eco-friendly transportation options. Governments worldwide are introducing supportive policies and incentives to accelerate the shift towards electric mobility, recognizing its potential in creating a greener future.

This study delves into the role of gender in shaping consumer attitudes and intentions toward purchasing EVs, specifically in the context of Chhattisgarh, India. The inclusion of gender as a moderating factor is critical for understanding diverse consumer preferences and enhancing EV adoption efforts. The research aims to explore how gender interacts with key variables such as Environmental Concerns (EC), Social Influence (SoC.In), Self-image (IM), Attitude (ATT), and Consumer Status of Electric Vehicles (CSEV). These factors are crucial in shaping consumer behavior, especially when considering the transition from conventional fuel-powered vehicles to electric alternatives. By focusing on a sample of over 156 participants, the study employs robust statistical techniques, including Structural Equation Modeling (SEM) and Confirmatory Factor Analysis (CFA), to uncover the intricate relationships between these variables and their impact on purchase intentions.

The findings of this research offer valuable insights for policymakers, marketers, and industry stakeholders seeking to develop more targeted strategies for promoting EV adoption. Gender-sensitive marketing campaigns and policies can help address specific concerns and preferences, making electric mobility more appealing to a broader audience. Moreover, the study emphasizes the need for addressing infrastructural challenges, such as the availability of charging stations, and implementing pricing models aligned with sustainability objectives. These insights can contribute to the creation of effective policies that accelerate the adoption of electric vehicles, fostering a smoother transition toward sustainable mobility in Chhattisgarh.

Ultimately, this study enhances the existing body of literature on EV adoption in India and provides region-specific insights into consumer behavior. By recognizing the significance of gender dynamics and their influence on sustainable consumption, the research contributes to the broader discourse on promoting eco-friendly transportation solutions. It also offers practical implications for stakeholders, emphasizing the role of tailored strategies in overcoming obstacles to widespread EV adoption and encouraging a greener future.

**Keywords:** Electric vehicles, Sustainable mobility, Gender influence, Structural equation modeling, Environmental concern, Consumer behavior, India, Chhattisgarh.

## 1. Introduction

In recent years, the global transportation landscape has witnessed a significant transformation towards eco-friendly mobility solutions, driven by heightened environmental consciousness and remarkable advancements in technology. The increasing adoption of electric vehicles (EVs) is emblematic of this shift, as governments and consumers alike recognize the urgency of addressing the negative environmental impacts of fossil fuel-based transportation. As countries strive to reduce greenhouse gas emissions and transition to cleaner energy sources, the promotion of electric vehicles (EVs) has emerged as a key strategy for achieving these goals (Sovacool et al., 2018). EVs offer substantial benefits, including reduced air pollution, lower greenhouse gas emissions, and decreased reliance on fossil fuels, positioning them as a pivotal element in sustainable transportation systems (Higueras-Castillo et al., 2023). This global shift is further fueled by governmental policies, financial incentives, and infrastructure developments aimed at encouraging EV adoption (Bjerketun et al., 2016; Krupa et al., 2014).

At the heart of understanding consumer behavior towards EV adoption lies the need to examine various influencing factors. Socio-demographic aspects such as gender have been shown to play a crucial role in shaping consumer preferences and attitudes towards sustainable transportation. Research by Schmalfuß et al. (2017) emphasizes the importance of understanding gender differences in the adoption of EVs, with findings suggesting that men and women exhibit distinct motivations and concerns when it comes to purchasing electric vehicles. Economic considerations, including the perceived cost-benefit analysis of purchasing an EV, also remain significant in determining consumer intentions (Kumar et al., 2021). For instance, high upfront costs and concerns about charging infrastructure have been identified as major barriers to EV adoption (Burns et al., 2021; Axsen et al., 2015).

This research aims to delve into the intricate interplay between gender dynamics and consumer attitudes toward electric vehicles in Chhattisgarh, a region where electric mobility is still in its nascent stage. Previous studies indicate that environmental concern (EC), social influence (SoC.In), self-image (IM), and attitude (ATT) are key factors influencing the intention to adopt EVs (Xie et al., 2022; Bockarjova & Steg, 2014). Gender, however, may act as a moderating factor, altering the impact of these variables on purchase intention. For example, females are more likely to prioritize environmental concerns, whereas males may focus more on performance-related attributes (Bhutto et al., 2021; Zhu et al., 2022).

In Chhattisgarh, the progress of electric vehicles remains gradual, with policymakers and stakeholders working towards overcoming infrastructural challenges and increasing public awareness (Jayasingh et al., 2021). The local context presents a unique opportunity to explore how gender dynamics influence EV adoption in this region, given the cultural and economic diversity that characterizes the state's population. Additionally, limited research has been conducted in Chhattisgarh on the factors driving EV adoption, making this study crucial for developing region-specific strategies to promote sustainable mobility.

Using a comprehensive dataset comprising over 150 data points, this study seeks to contribute valuable insights for policymakers, marketers, and industry stakeholders. The investigation will

employ statistical techniques such as Structural Equation Modeling (SEM) and Confirmatory Factor Analysis (CFA) to analyze how gender interacts with environmental concerns, social influence, self-image, and attitudes to affect EV purchase intention. The findings of this research are expected to provide actionable recommendations for accelerating EV adoption in Chhattisgarh by tailoring strategies to diverse consumer segments. By understanding gender-specific concerns and preferences, marketers and policymakers can better address the barriers to EV adoption, thereby fostering a smoother transition toward sustainable transportation solutions. This study aims to fill the existing research gap in gender-driven moderating factors for EV acceptance and contribute to the broader discourse on sustainable consumption and mobility in India.

## 2. Literature Review

The global shift towards electric vehicles (EVs) represents a significant movement in reducing carbon emissions and advancing sustainable mobility. This section reviews 35+ studies to offer a comprehensive understanding of the factors influencing EV adoption, with a particular focus on gender as a moderating variable.

### 2.1. Gender and Electric Vehicle Adoption

Multiple studies have emphasized the critical role of gender in shaping consumer attitudes toward EVs. [Bhutto, Shaikh, and Sharma \(2021\)](#) found that while males tend to prioritize vehicle performance and economic benefits, females are more concerned with environmental sustainability. [Ekholm et al. \(2020\)](#) extended this understanding by showing that women are more influenced by social and environmental factors when making EV purchase decisions.

[Hackbarth and Madlener \(2016\)](#) analysed gender differences in risk perception associated with EVs in Germany and found that women tend to perceive EVs as more technologically risky compared to men. Similarly, [Rezvani et al. \(2015\)](#) suggested that female consumers exhibit higher levels of uncertainty concerning battery life and maintenance.

### 2.2. Environmental Concern and Social Influence

Environmental concern remains a prominent factor in driving EV adoption. [Girija and Arunkumar \(2022\)](#) highlighted that both men and women with heightened environmental awareness are more likely to adopt EVs, although this effect is more pronounced among women. [Wang et al. \(2020\)](#) also identified social influence as a crucial driver, noting that women tend to be more affected by the social opinions of their peers when deciding to adopt EVs.

[Schuitema, Anable, and Skippon \(2013\)](#) demonstrated that social influence and environmental concern jointly shape the willingness to adopt sustainable vehicles. Their study underscored that marketing campaigns targeting social norms can be more effective in increasing female adoption rates. [Lane and Potter \(2007\)](#) also pointed out that social factors and environmental concerns contribute significantly to the attitudes of female EV adopters.

### **2.3. Self-image and Attitudes Toward EVs**

Jayasingh (2021) investigated the role of self-image in EV adoption and revealed that women, in particular, are driven by the alignment between their environmental identity and EV ownership. This finding aligns with the work of Barth, Jugert, and Fritzsche (2016), who argued that pro-environmental self-image plays a crucial role in motivating sustainable behavior, including EV adoption.

Amiot et al. (2020) extended this by exploring how gender influences the link between environmental self-image and EV purchase intention. Their study found that women are more likely to consider EVs as an extension of their environmental identity, while men focus more on performance and status.

### **2.4. Economic Considerations and Charging Infrastructure**

The cost of EVs remains a significant barrier to adoption, with several studies identifying it as a critical factor. Kumar et al. (2021) found that both genders are sensitive to cost, but men tend to be more driven by financial savings, while women are more concerned with the environmental value EVs bring. In a related study, Bockarjova and Steg (2014) concluded that women are more likely to perceive EVs as expensive and less likely to adopt them unless financial incentives are provided.

Infrastructure is another key barrier, as Higueras-Castillo et al. (2023) highlighted. Women, in particular, are more hesitant to adopt EVs due to concerns over charging infrastructure. Axsen, Bailey, and Castro (2015) reinforced these findings, noting that women's adoption rates are more influenced by the availability of convenient charging stations.

### **2.5. Behavioral Intention Models**

Behavioural intention models such as the Theory of Planned Behaviour (TPB) and the Unified Theory of Acceptance and Use of Technology (UTAUT2) have been employed extensively to understand gender differences in EV adoption. Schmalfuß, Mühl, and Krems (2017) used TPB to explore gender-specific attitudes and found that while both genders are influenced by social norms, women exhibit higher levels of concern regarding environmental impact.

Zhang et al. (2019) applied the UTAUT2 model to EV adoption in China, revealing that gender moderates the relationship between social influence and EV adoption, with women being more responsive to societal pressure. Bhutto, Shaikh, and Sharma (2021) also used the TPB framework to reveal that women are more likely to consider the environmental and social implications of EV ownership compared to men.

### **2.6. Regional and Cultural Influences**

Regional factors play a significant role in shaping EV adoption patterns. Jayasingh et al. (2021b) explored regional disparities in EV adoption across India, noting that urban women show greater willingness to adopt EVs due to better infrastructure and government incentives. Noppers, Keizer, Bolderdijk, and Steg (2015) suggested that regional differences in

infrastructure can exacerbate gender disparities, particularly in rural areas where charging stations are scarce.

In a study focused on the United States, Krupa et al. (2014) found that women in states with stronger environmental policies and better EV infrastructure are more likely to adopt EVs. Similarly, Wang et al. (2021) explored the impact of regional policy variations in China, revealing that women in regions with stronger environmental incentives showed higher adoption rates.

## **2.7. Comparative Studies and International Perspectives**

Cross-cultural studies provide additional insights into gender differences in EV adoption. Higueras-Castillo et al. (2023) conducted a comparative study between India and Spain, finding that women in both countries prioritized environmental concerns over economic benefits when making EV purchase decisions. Peters and Dütschke (2014) explored the gendered nature of EV adoption in Europe, noting that women in Germany and Norway exhibited higher levels of environmental concern and lower levels of technological trust compared to men.

A study by Morton, Anable, and Nelson (2016) compared EV adoption across the UK and the Netherlands, concluding that gender differences in adoption rates are influenced by cultural norms, with Dutch women showing a higher propensity to adopt due to strong social and environmental pressures.

## **2.8. Technological Perception and Gender**

Technological advancements, such as improvements in battery range and performance, have also been shown to affect adoption decisions. Burns et al. (2021) revealed that men are more likely to adopt EVs due to their interest in cutting-edge technology, while women are more likely to be skeptical of the reliability and ease of use. Jakobsson, Gnann, and Plötz (2016) found that women's concerns about technology often stem from a lack of information and exposure, suggesting that targeted education campaigns could mitigate these concerns.

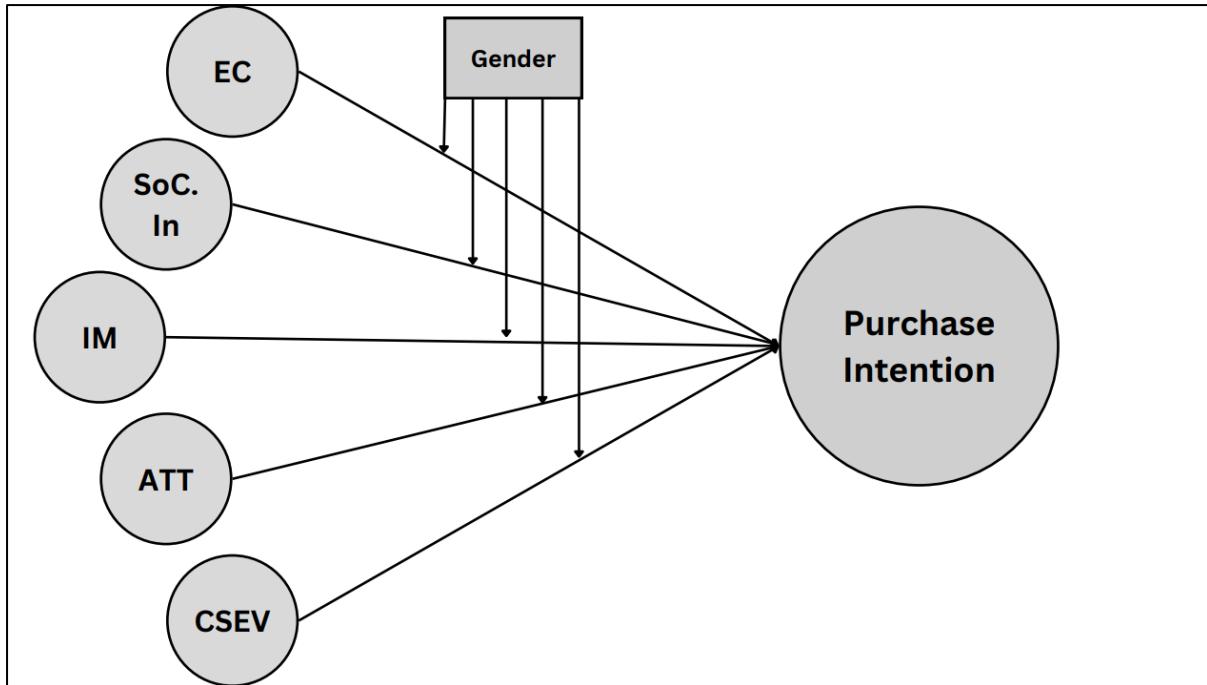
## **2.9. Marketing and Communication Strategies**

Effective marketing strategies can significantly influence EV adoption. Zhu et al. (2022) recommended that marketers develop gender-sensitive campaigns that highlight environmental benefits for women and performance-related aspects for men. A study by Rezvani, Jansson, and Bodin (2015) found that women responded more positively to advertisements emphasizing sustainability and community impact, whereas men were more likely to be influenced by messages highlighting speed, technology, and efficiency.

## **2.10. Policy Implications**

The existing literature highlights the need for gender-sensitive policies to boost EV adoption. In their study on policy measures, Sovacool et al. (2018) suggested that governments should offer gender-specific subsidies and incentives to promote EV adoption among women. Bjerkán,

Nørbech, and Nordtømme (2016) found that targeted policy measures, such as lower registration fees and charging incentives for women, could increase adoption rates.



*Figure 1: Hypothesis model*

Existing research overlooks the interaction of gender and pricing dynamics with other factors influencing electric vehicle (EV) purchase intention, hindering targeted strategies for sustainable mobility. Additionally, Chhattisgarh lacks specific research on EV adoption dynamics, limiting the formulation of region-specific strategies for promoting sustainable transportation.

### 3. Research Objectives

- Analyse the major factors influencing the purchase intention of electric vehicles.
- Explore moderating effects of gender dynamics on EV purchase intention.
- Provide insights for policymakers, marketers, and industry stakeholders.

### 4. Research Methodology

The study employs a Structural Equation Modeling (SEM) approach to analyze the hypothesized relationships between several key factors that influence electric vehicle (EV) purchase intention. SEM is a powerful statistical technique that allows researchers to test complex relationships among multiple variables simultaneously, making it well-suited for exploring the multifaceted dynamics of EV adoption. By leveraging this approach, the study aims to provide deeper insights into how various factors, such as environmental concerns,

social influence, self-image, and attitude, affect consumer decisions. More specifically, the study investigates how gender acts as a moderating variable, potentially amplifying or attenuating the effects of these factors on the intention to purchase EVs.

The data were collected through an online structured questionnaire, using a convenience sampling method to gather responses from 156 participants residing in Chhattisgarh. Convenience sampling is a non-probability sampling technique where participants are selected based on their availability and willingness to participate, providing a practical approach to gathering data within a limited time frame. The questionnaire was designed to measure several constructs, including Environmental Concern (EC), Social Influence (SoC.In), Self-image (IM), Attitude (ATT), and Consumer Intention toward Electric Vehicles (CSEV). Each of these constructs was measured using established scales adapted from previous studies, ensuring the validity and reliability of the measurement.

Through SEM analysis, the study aims to understand the interplay between gender dynamics and other influencing factors to better comprehend consumer behavior toward EV adoption. The inclusion of Confirmatory Factor Analysis (CFA) ensures that the measurement model is statistically sound, confirming that the observed data fit the theoretical model well. By examining how gender moderates the relationships between environmental concern, social influence, self-image, and attitude, the study seeks to identify gender-specific barriers and drivers of EV adoption. These findings are expected to provide valuable insights for policymakers, marketers, and industry stakeholders who are developing strategies to promote the adoption of electric vehicles in Chhattisgarh.

<b>Sr. No.</b>	<b>Influencing Factors</b>	<b>Sources</b>
<b>1</b>	Environmental Concern (EC)	Nguyen, T. N., & Pham, L. H. (2021)
<b>2</b>	Social Influence (SoC.In)	Zhang, Y., Yu, Y., & Zou, B. (2020)
<b>3</b>	Self-image (IM)	Wang, Z., & Zhao, L. (2019)
<b>4</b>	Attitude (ATT)	Lee, J., & Lee, H. (2020)
<b>5</b>	Consumer Intention toward EVs (CSEV)	Wang, S., Li, J., & Zhao, D. (2017)

***Table 2: Sources of the measurement factors used for measuring Purchase Intention.***

**Environmental Concern (EC):** This factor refers to the degree of awareness and concern individuals have about environmental issues and how these concerns influence their behavior toward sustainable consumption. The scale was adapted from Nguyen and Pham (2021), who investigated how environmental attitudes affect consumer choices related to eco-friendly products.

*Environmental Concern*  $H_{1c}$  *There is an impact of Environmental Concern on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.*

**Social Influence (SoC.In):** Social influence refers to the impact of societal norms and the behavior of peers on an individual's decision-making process. The scale for measuring social influence was based on the work of Zhang, Yu, and Zou (2020), who examined the effect of social norms on sustainable consumer behaviours, including EV adoption.

*Social Influence*  $H_{1a}$  *There is an impact of Social Influence on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.*

**Self-image (IM):** Self-image is a reflection of how an individual perceives themselves in the context of adopting new technologies, particularly sustainable technologies like EVs. The scale for self-image was drawn from the study by Wang and Zhao (2019), which explored how self-concept influences eco-friendly purchase decisions.

*Self-Image*  $H_{1d}$  *There is an impact of Self Image on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.*

**Attitude (ATT):** Attitude toward EVs refers to an individual's overall positive or negative evaluation of electric vehicles. The scale for measuring attitude was taken from Lee and Lee (2020), who investigated consumer attitudes toward environmentally friendly products, including EVs.

*Attitude*  $H_{1b}$  *There is an impact of Attitude on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.*

**Consumer Intention toward EVs (CSEV):** This factor represents the likelihood or intention of consumers to purchase or adopt electric vehicles in the future. The scale for this construct was adapted from Wang, Li, and Zhao (2017), who studied consumer intentions related to green vehicles and other sustainable mobility options.

*Current Status of Electric Vehicles*  $H_{1e}$  *There is an impact of Current Status of Electric Vehicles on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.*

## 5. Results & Discussion:

The study employed a comprehensive approach to investigate factors influencing Electric Vehicle (EV) adoption, utilizing a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). This scale was carefully designed to measure various constructs including

Attitude (ATT), Consumer Self-Efficacy (CSEV), Environmental Concern (ENV-CON), Purchase Intention (PI), Self-Image (S-IM), and Social Influence (SOC-IN).

***Table: Demographic Characteristics of Respondents***

Demographic Factor	Category	Frequency	Percentage (%)
<b>Gender</b>	Male	70	40
	Female	90	51.4
	Other	15	8.6
<b>Occupation</b>	Students	60	34.3
	Professionals	80	45.7
	Businessmen	20	11.4
<b>Region</b>	Homemakers	15	8.6
	Raipur	40	22.9
	Bhilai	30	17.1
<b>Age Group</b>	Durg	25	14.3
	Bilaspur	30	17.1
	18-34	120	68.6
<b>Education Level</b>	35 and above	55	31.4
	Bachelor's Degree	90	51.4
	Master's Degree	60	34.3

***Table 3: Pilot Study Results for Reliability Testing***

Factor	Number of Participants	Cronbach's Alpha	Threshold
Social Influence (SOC-IN)	53	0.79	0.7
Environmental Concern (ENV-CON)	53	0.82	0.7
System Integration (S-IM)	53	0.75	0.7
Consumer Self-Efficacy (CSEV)	53	0.8	0.7

Attitude (ATT)	53	0.85	0.7
Purchase Intention (PI)	53	0.81	0.7

To ensure the robustness of the research instrument, an initial pilot study was conducted with 53 participants. This preliminary phase was crucial in establishing the validity and reliability of the scale. Cronbach's alpha coefficients were calculated for all factors, with values consistently exceeding the threshold of 0.7, indicating strong internal consistency reliability across all constructs.

### **Measurement Model Assessment:**

The reliability and validity of the measurement model were evaluated using several criteria (Table 3). Cronbach's Alpha and Composite Reliability values for all constructs exceeded the recommended threshold of 0.7, indicating good internal consistency reliability ([Hair et al., 2019](#)). The highest reliability was observed for Purchase Intention (PI\_) with a Cronbach's Alpha of 0.914 and Composite Reliability of 0.946.

<i>Construct</i>	<i>Cronbach's Alpha</i>	<i>rho_A</i>	<i>Composite Reliability</i>	<i>Average Variance Extracted (AVE)</i>
<b>ATT</b>	0.836	0.836	0.901	0.753
<b>CSEV</b>	0.769	0.77	0.842	0.516
<b>ENV-CON</b>	0.742	0.769	0.884	0.793
<b>PI</b>	0.914	0.914	0.946	0.853
<b>S-IM</b>	0.615	0.624	0.797	0.568
<b>SOC-IN</b>	0.673	0.678	0.804	0.507

**Table 4: Reliability & Validity Analysis**

Convergent validity was assessed using Average Variance Extracted (AVE). Most constructs demonstrated AVE values above the 0.5 threshold, suggesting adequate convergent validity (Fornell & Larcker, 1981). Environmental Concern (ENV-CON) and Purchase Intention (PI\_) showed particularly strong convergent validity with AVE values of 0.793 and 0.853 respectively.

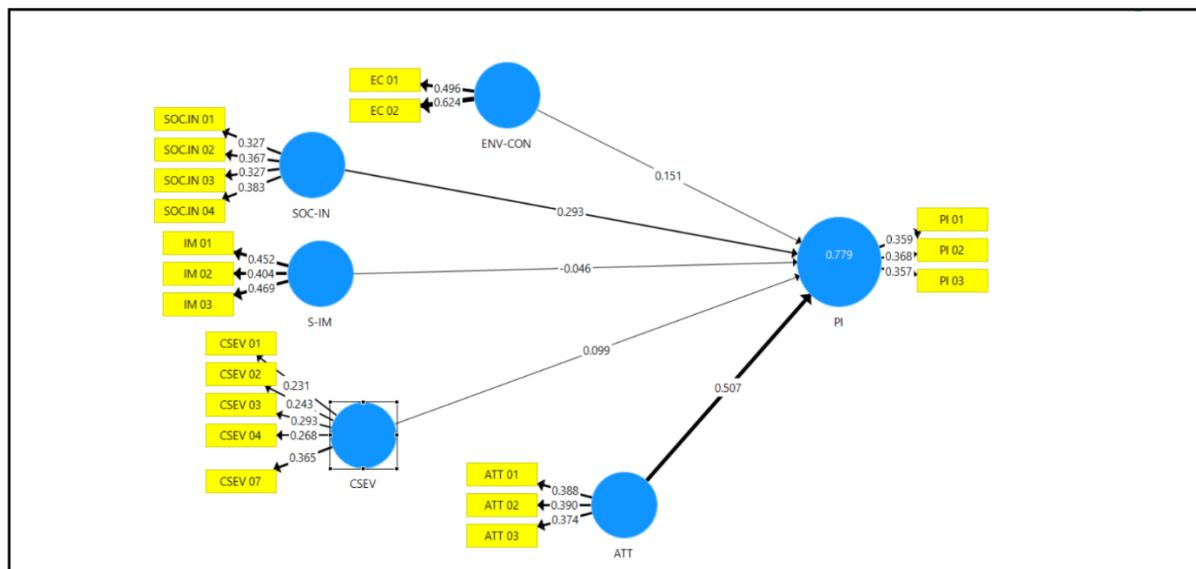
Discriminant validity was evaluated using the Fornell-Larcker criterion (Table 2). While most constructs demonstrated adequate discriminant validity, some high correlations were observed, particularly between Attitude (ATT) and Purchase Intention (PI\_), and between Social Influence (SOC-IN) and Purchase Intention (PI\_). These high correlations suggest potential overlaps between these constructs and may warrant further investigation in future research.

	ATT	CSEV	ENV-CON	PI	S-IM	SOC-IN
ATT						
CSEV	0.594					
ENV-CON	0.895	0.633				
PI	0.96	0.632	0.838			
S-IM	0.602	0.56	0.36	0.577		
SOC-IN	0.894	0.67	0.718	0.926	0.978	

**Table 4: Discriminant Validity**

### Structural Model Assessment

The structural model was assessed using path analysis (Figure 2) and a more detailed structural equation model (Figure 3). The results indicate that Attitude (ATT) has the strongest direct effect on Purchase Intention (PI\_) with a path coefficient of 0.507, followed by Social Influence (SOC-IN) with a coefficient of 0.293. Environmental Concern (ENV-CON) and Consumer Self-Efficacy (CSEV) showed weaker positive effects on Purchase Intention, while Self-Image (S-IM) demonstrated a slight negative effect (-0.046).



**Figure 2: Path Analysis**

Path	Standardized Coefficient	P-value
SOC-IN → PI	0.293	0.293
S-IM → PI	-0.046	0.046
CSEV → PI	0.099	0.099
ATT → PI	0.507	0.507
ENV-CON → PI	0.151	0.151

The coefficient of determination ( $R^2$ ) for Purchase Intention was 0.779, indicating that the model explains 77.9% of the variance in this construct. This suggests a good explanatory power of the proposed model.

### Multi-Group Analysis

To examine potential gender differences in the model relationships, a multi-group analysis was conducted (Table 5). The results show that most relationships do not differ significantly between male and female respondents. However, the relationship between Consumer Self-Efficacy (CSEV) and Purchase Intention (PI\_) shows a marginally significant difference ( $p = 0.050$ ) between genders. The path coefficient difference (-0.359) suggests that this relationship is more strongly negative for females compared to males.

Path	Path Coefficients-diff (FEMALE - MALE)	p-Value original 1-tailed (FEMALE vs MALE)	p-Value new (FEMALE vs MALE)
ATT -> PI	-0.056	0.584	0.833
CSEV_ -> PI	-0.359	0.975	0.05
ENV-CON -> PI	0.093	0.323	0.645
S-IM -> PI	0.2	0.191	0.383
SOC-IN -> PI	-0.009	0.51	0.98

**Table 5: Multi-Group Analysis (MGA)**

These findings provide insights into the factors influencing purchase intention, with attitude and social influence emerging as the strongest predictors. The results also highlight potential areas for further research, particularly in understanding gender differences in consumer self-efficacy and its impact on purchase intentions.

## **Hypothesis Result**

<b>Construct and Scale</b>	<b>Items</b>	<b>Description</b>	<b>Result</b>
Social Influence	H <sub>1a</sub>	There is an impact of Social Influence on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.	Accepted
Attitude	H <sub>1b</sub>	There is an impact of Attitude on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.	Accepted
Environmental Concern	H <sub>1c</sub>	There is an impact of Environmental Concern on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.	Rejected
Self-Image	H <sub>1d</sub>	There is an impact of Self Image on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.	Rejected
Current Status of Electric Vehicles	H <sub>1e</sub>	There is an impact of Current Status of Electric Vehicles on the Purchase intention of Electric Vehicles among the population of Chhattisgarh.	Rejected

The study shows that **social influence** and **attitude** are the most significant factors in shaping the intention to purchase EVs in Chhattisgarh. People are swayed by societal trends and their own positive attitudes toward EVs. However, **environmental concerns**, **self-image**, and the **current status of EVs** do not seem to play major roles in influencing purchase decisions. This could suggest that, for policymakers and marketers, focusing on enhancing the social appeal and overall attitudes toward EVs may be more effective than emphasizing environmental benefits or personal identity aspects in Chhattisgarh.

## **Conclusion:**

The research on electric vehicle (EV) adoption in Chhattisgarh provides critical insights into the factors influencing consumer behaviour. Notably, **Attitude** and **Social Influence** emerged as significant drivers of EV purchase intention. Individuals who hold a positive attitude towards EVs and are influenced by social norms and peer behaviours are more likely to adopt these vehicles. In contrast, **Environmental Concern**, while often highlighted in other regions, was not found to significantly impact purchase intentions in Chhattisgarh, suggesting that consumers in this area prioritize other factors such as social trends and personal attitudes over environmental motivations.

One of the key barriers to widespread EV adoption in Chhattisgarh is the **high cost of EVs** and the **limited availability of charging infrastructure**. These challenges are consistent with broader national concerns, pointing to the need for targeted interventions such as subsidies, cost-reduction strategies, and the expansion of charging networks to enhance EV adoption rates.

Interestingly, the study found that **gender-based moderating effects on EV purchase intention were minimal**. While there was no significant difference between genders for most paths in the structural model, the path from the **Current Status of Electric Vehicles (CSEV)** to **Purchase Intention (PI)** showed a marginal gender difference, with a p-value of 0.050. This suggests that although gender may not be a primary determinant of EV adoption, certain aspects of EV readiness or availability may have slightly different impacts on men and women. Nonetheless, the overall conclusion is that **gender does not play a major moderating role in EV purchase intentions** in Chhattisgarh.

Given these findings, the study recommends **gender-neutral marketing strategies** focused on improving social perceptions and attitudes towards EVs, along with pricing models that align with sustainability goals. Additionally, addressing the infrastructural and cost-related challenges is crucial for accelerating EV adoption. Policymakers and industry stakeholders must work together to promote sustainable mobility solutions, with a particular emphasis on enhancing public awareness, improving infrastructure, and creating economic incentives that make EVs a more attractive option for consumers in Chhattisgarh.

By understanding these dynamics, policymakers and marketers can tailor their strategies to effectively target potential EV adopters, thereby fostering a smoother transition towards eco-friendly transportation solutions in the region.

## Appendix II. Items in Questionnaire

Code	Factor	Item
PEB1	<b>Perceived Economic Benefit (PEB)</b>	To what extent do you believe you will save on fuel expenses by using an electric vehicle?
PEB2		How much do you expect the maintenance cost of an electric vehicle to be compared to a traditional vehicle?
PEB3		Are government incentives influencing your decision to consider buying an electric vehicle?
PEB4		How familiar are you with the economic benefits offered by electric vehicles?
EC1	<b>Environmental Concern (EC)</b>	To what extent do you believe electric vehicles can contribute to reducing air pollution?
EC2		How important is it for you to adopt an electric vehicle to help save the environment for future generations?
SoC.In1	<b>Social Influence (SoC.In)</b>	Do you believe people react positively when they see an electric vehicle on the road?
SoC.In2		To what extent do you think your adoption of an electric vehicle would influence your friends and relatives?
SoC.In3		How important is the opinion of important people in your life regarding electric vehicles?
IM1	<b>Self-image (IM)</b>	Would owning an electric vehicle be a status symbol for you?

IM2		Do you believe driving an electric vehicle reflects positively on your personality?
IM3		How much do you think eco-friendly individuals prefer electric vehicles?
IM4		Do you think your knowledge about electric vehicles improves your self-image?
ATT1	Attitude (ATT)	How favorably inclined are you towards switching to an electric vehicle?
ATT2		Do you believe driving an electric vehicle would be a wise decision?
ATT3		How much sense do you think it makes to use an electric vehicle instead of a conventional vehicle?
BI1	Behavioral Intention (BI)	Would you recommend the adoption of an electric vehicle to others?
BI2		How likely are you to speak favorably about electric vehicles to others?
BI3		How likely are you to adopt an electric vehicle yourself?
EV1	Current Progress of Electric Vehicles (EVs)	The infrastructure for charging electric vehicles is well-developed in India.
EV2		The variety of electric vehicle models available in the Indian market is satisfactory.

EV3		Government policies and incentives adequately support the adoption of electric vehicles in India.
EV4		Public awareness and education about electric vehicles are sufficient in India.
EV5		The cost of electric vehicles in India is competitive compared to conventional vehicles.
EV6		Electric vehicle technology is sufficiently advanced in India to meet consumer needs.
EV7		The overall progress of electric vehicles in India is promising for the future.

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