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AN INVESTIGATIVE ANALYSIS OF THE MARKET PROSPECTS AND CONSUMER BEHAVIORAL INTENTIONS FOR NEW ENERGY VEHICLES IN GUANGXI UNDER THE CONTEXT OF NEW QUALITY PRODUCTIVITY

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Abstract: This paper explores the market prospects and consumer behavior intentions towards new energy vehicles in Guangxi under the context of new quality productivity. By comprehensively applying the American Customer Satisfaction Index (ACSI) theory, Stimulus-Organism-Response (SOR) model, structural equation modeling, and K-means cluster analysis, the multidimensional characteristics of consumer behavior are revealed. The findings are as follows: (1) Age, occupation, monthly income, and marital and parental status significantly influence the purchase of new energy vehicles. Older individuals, higher-income corporate employees and drivers, as well as those who are married with children, have a higher purchase rate. (2) Purchasers prioritize technological innovation and functionality when buying new energy vehicles and tend to opt for emerging brands that incorporate new technologies. Customer satisfaction is directly linked to the quality of new energy vehicles, affecting the willingness for repeat purchases and recommendation behaviors. Thus, enhancing the perception of quality is crucial. (3) The main reason non-purchasers have not bought new energy vehicles is their concerns about safety. Enhancing safety, battery life, and cost-effectiveness are key to attracting potential consumers. Positive feedback on product awareness and online reviews influences purchasing intentions, necessitating targeted approaches to meet the diverse needs of different consumer groups to increase market penetration.

Keywords: New Quality Productivity; Guangxi; New Energy Vehicles; Structural Equation Modeling; Strategic Analysis

1 INTRODUCTION

On September 7, 2023, General Secretary Xi Jinping introduced the new concept of "New Quality Productivity" at the symposium on promoting the comprehensive revitalization of Northeast China in the new era. This concept delineates the path for technological development in China, emphasizing the role of technological innovation in leading the construction of a modern industrial system. It aims to drive industrial innovation through disruptive and cutting-edge technologies, fostering new industries, new models, and new drivers of growth with the development of new quality productivity[1]. Within the industries characterized by new quality productivity, new energy vehicles have already become extensively integrated into our lives. New energy vehicles, as substitutes for traditional gasoline-powered cars, have been in constant competition with them since their inception. The automotive industry continues to advance, with the development of new energy vehicles increasingly impacting traditional fuel vehicles. Intelligent connected new energy vehicles represent a more advanced form of new quality productivity. Their emergence compared to traditional fuel vehicles is not merely a simple replacement, but a comprehensive evolution. The national government has released numerous policies to support new energy vehicles, categorizing them into four types: regulatory restrictions, economic incentives, support system enhancements, and technological advancements. Exploring the market capacity and potential of new energy vehicles is of significant importance for the development of new quality productivity in China. Additionally, the "Fourteenth Five-Year Plan" explicitly states: "By 2025, the competitiveness of China's new energy vehicle market will have significantly increased, and the core technologies of China's new energy vehicles will reach an internationally advanced level."

According to data, China's domestic sales of new energy vehicles reached 8.292 million units in 2023, marking a year-on-year increase of 33.5%. Exports of new energy vehicles amounted to 1.203 million units, with a year-on-year growth of 77.6%, and the market share reached 31.6%. Data reported by the Guangxi Daily indicates that in Liuzhou, Guangxi, more than 50 out of every 100 vehicles sold are new energy vehicles, and one out of every ten new energy vehicles nationwide is produced in Liuzhou[2]. In advancing the modernization process of China, new quality productivity represents a novel exploration of emerging and future industries, Broadly defined, new quality productivity refers to a new, high level of modernization. As a vital component of new quality productivity, new energy vehicles embody various characteristics of this concept. Studying their market prospects and consumer willingness can provide valuable insights for unlocking market opportunities for other new quality productivity sectors. Fan J et al. [3] found that factors such as economic benefits, performance attributes, environmental awareness, and government policies are crucial for consumers to accept new energy vehicles. Yang Yue[4] mentioned that personal purchase intention is related to behavioral attitudes, subjective norms, perceived behavior, perceived value, and so on. Ackaah Williams et al. [5] used the Theory of Planned Behavior (TPB) to explain consumer purchase intention. Fishbein et al. [6] argued that consumer attitudes are influenced by purchasing intentions and, together with other external factors, affect consumer behavior. Hines et al. [7] suggested that both external situational factors (various policies) and internal situational factors (perceived value, perceived risk, herd mentality) impact purchasing intentions.

Through a literature review, this paper views the consumer behavior towards new energy vehicles as a process of "external factors-internal factors-new energy vehicle purchasing behavior". It examines consumer behavior across six dimensions: brand image, customer expectations, perceived quality, perceived value, customer satisfaction, and customer loyalty. A structural equation model is constructed to analyze consumers' reactions to purchasing intentions for new energy vehicles, providing precise and diversified recommendations for businesses and governments.

In summary, this paper focuses on Guangxi as the primary survey area to explore the current state of the new energy vehicle market. It analyzes the market prospects and consumer behavioral intentions, offering suggestions for the development of new energy vehicles.

2 RESEARCH DESIGN

2.1 Data Sources and Preprocessing

A survey method was employed, utilizing online social platforms for the distribution of questionnaires, to study the current state of new energy vehicle development in Guangxi, as well as consumer purchasing intentions and satisfaction. This approach provides multifaceted insights for the innovative development and marketing promotion of new energy vehicles. On one hand, for consumers who have not purchased new energy vehicles, we investigated the primary reasons for not purchasing, their cognitive evaluations of the product, functional expectations, and the desire and extent to which they are inclined to buy, in order to analyze their purchasing intentions. On the other hand, for new energy vehicle users, we examined their user experience, comparing aspects such as battery life with traditional fuel vehicles, to analyze their satisfaction. The questionnaire was designed and distributed based on the above considerations.

After distributing the questionnaires, the returned copies were manually entered and thoroughly reviewed. Questionnaires with inconsistencies or a significant number of unanswered items were considered invalid and discarded. In instances where a questionnaire had one or several items with missing data, Matlab was used for handling these missing values. The script's code blocks utilized the `missing` or `remove` functions to clean up the missing data without affecting the analysis of other items. Thus, questionnaires with missing values were retained as valid but excluded only from the relevant analyses as necessary. Following these steps, a total of 340 questionnaires were collected, out of which 335 were deemed valid, resulting in a final validity rate of 98.53%.

Given that internal consistency reliability is the most frequently employed method for evaluating the reliability of scales in market research, this study primarily assessed the internal consistency of the questionnaire using Alpha reliability. This was accomplished by calculating the Cronbach's alpha coefficient for each survey item using SPSS26.0 statistical software. Each option in the multiple-choice questions was divided into several dichotomous sub-items. Based on the

internal relationships among the questions, these were grouped into two main categories: the satisfaction levels of current new energy vehicle owners and the purchasing intentions of non-owners. The reliability testing conducted with SPSS26.0 indicated that the Cronbach's Alpha coefficients for both categories were above 0.60, with an overall questionnaire reliability of 0.974. This level of reliability is highly credible, indicating that the scales are fully acceptable without need for adjustment, and affirming the scientific and rational design of the questionnaire structure and item configuration.

Table 1 Reliability Statistics

Category	Cronbach's Alpha	Number of Items
Satisfaction with NEVs	0.991	4
Purchase Intention of NEVs	0.674	2
Overall	0.974	6

Validity refers to the effectiveness, objectivity, reliability, and practicality of a measure, and it assesses the extent to which the results truly reflect the characteristic intended to be measured. To determine the structural validity of the instrument, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were conducted. The results indicated a KMO value of 0.890, which is well above the acceptable threshold of 0.6, and the significance of Bartlett's Test of Sphericity was 0.000. This suggests that the data are suitable for factor analysis, allowing for the testing of structural validity.

Table 2 KMO and Bartlett's Test of Sphericity Results (Formal Survey)

Kaiser-Meyer-Olkin (KMO)		0.890
Bartlett's Test of Sphericity	Approx. Chi-Square	1874.474
	DF	6
	Significance	0.000

The results of the factor analysis indicated that two common factors were extracted based on the condition that their eigenvalues exceeded 1. The cumulative percentage of variance explained by these factors reached 97.431%, demonstrating that the structural validity is acceptable. This high variance explained suggests that the factors effectively capture the underlying dimensions of the data being analyzed.

Table 3 Validity Analysis Results

	Initial Eigenvalues			Extrction Sums of Squared Loadings		
Component						
	Total	%of	Cumulative%	Total	%of	Cumulative%
	Variance			Variance		
1	2.599	64.965	64.965	2.599	64.965	64.965
2	3.897	97.431	97.431	3.897	97.431	97.431

2.2 Empirical Analysis Method Design

2.2.1 Qualitative analysis

2.2.1.1 Inductive analysis method

Prior to conducting the survey, we reviewed relevant materials, literature, news articles, and statistical data to understand the current state of new energy vehicle development and market pain points in Guangxi Province. Through the questionnaire survey, we gauged user satisfaction with new energy vehicles and customer purchasing intentions. We

recorded and organized the content from the literature and survey results to gain a deeper understanding of the development of new energy vehicles.

2.2.1.2 Comparative analysis method

In this survey, we categorized users' feelings about their use of new energy vehicles and conducted a comparative analysis of user satisfaction across different aspects of usage. This approach is beneficial for further analyzing the marketing strategies of new energy vehicles, as it helps identify strengths and areas for improvement in user experience that can influence marketing and development strategies.

2.2.2 Quantitative analysis

2.2.2.1 Verification analysis

After processing the data obtained from the survey, verification analysis is conducted. This involves performing reliability and validity tests on the questionnaire scales. These tests ensure that the measures used in the questionnaire are both stable and accurately reflect the constructs they are intended to measure.

2.2.2.2 Descriptive statistical analysis

The data from the questionnaire are entered into Excel, where various functions are used to compute statistics and present them in graphical form. This method provides a simple statistical summary that describes the distribution of the data, divided into three main parts: analysis of central tendency, analysis of dispersion, and correlation analysis. The characteristics of descriptive statistics allow for an intuitive understanding of the data features. In this study, frequency distribution graphs and other charts are created to visualize the basic information of the respondents, providing a clearer picture of the respondents' general distribution, their satisfaction with new energy vehicles, purchasing intentions, and potential for future development.

2.2.2.3 Structural equation modeling (SEM)

Structural Equation Modeling is a statistical method that analyzes the relationships between variables based on their covariance matrix. It is a vital tool in multivariate data analysis, commonly used for confirmatory factor analysis, higher-order factor analysis, path and causal analysis, multi-time period designs, simplex models, and multiple group comparisons. In this paper, the SEM is utilized to analyze user satisfaction with new energy vehicles based on evaluations from the questionnaire. The model incorporates six latent variables: brand image, customer expectations, perceived quality, perceived value, customer satisfaction, and customer loyalty.

2.2.2.4 S-O-R model

The Stimulus-Organism-Response (S-O-R) model delineates how external stimuli (S) affect the emotional responses and behaviors (R) of a cognizant organism (O). This model is extensively used to study consumers' willingness to pay. In this study, the SOR model serves as the basic framework, incorporating variables of interest to consumers who have not previously purchased new energy vehicles. Product awareness, online reviews, and advertising features are considered external stimulus variables (S), perceived value is treated as the organism variable (O), and purchasing intention is the response variable (R). This forms the theoretical model affecting consumers' purchasing intentions towards new energy vehicles.

2.2.2.5 K-means clustering algorithm

The k-means clustering algorithm is an iterative clustering analysis method that organizes data members with similar characteristics into categories. This study employs the K-means algorithm to cluster potential consumer data, thereby identifying the fundamental characteristics of potential consumer groups. Based on these characteristics, effective insights are provided for industry stakeholders to better understand and target their consumer base.

2.3 Structural Equation Modeling

Structural Equation Models (SEM) are a generalized linear statistical modeling technique that has become a crucial statistical analysis tool and methodological approach in contemporary behavioral, psychological, and social research. It was later introduced into the field of economic management. SEM integrates the statistical techniques of "factor analysis" and "path analysis" from traditional multivariate statistical analysis, allowing for the identification, estimation,

and validation of various causal models. SEM deals with latent variables that cannot be directly observed but are of interest to researchers. These latent variables are represented through observable variables (indicators), thus establishing structural relationships between them.

Given that this study pertains to the satisfaction with new energy vehicles, and considering the diversity of new energy vehicle brands used by different consumers, variables such as customer satisfaction cannot be directly and accurately measured. They require indirect measurement through other indicators. SEM is particularly useful in this context because it does not impose stringent assumption conditions and allows for measurement errors in both independent and dependent variables. This capability effectively addresses such issues.

Therefore, this paper utilizes structural equation modeling to construct a realistic, objective, effective, and comprehensive model of the factors influencing consumer satisfaction in the new energy vehicle sector. By exploring the factors and degrees of satisfaction among respondents, the study offers practical suggestions and strategies to promote the sustainable development of the new energy vehicle market.

This research constructs a structural equation model based on the ACSI theory, involving variables such as new energy vehicle brand image, perceived quality, customer expectations, perceived value, customer satisfaction, and customer loyalty, as illustrated in Figure (1):

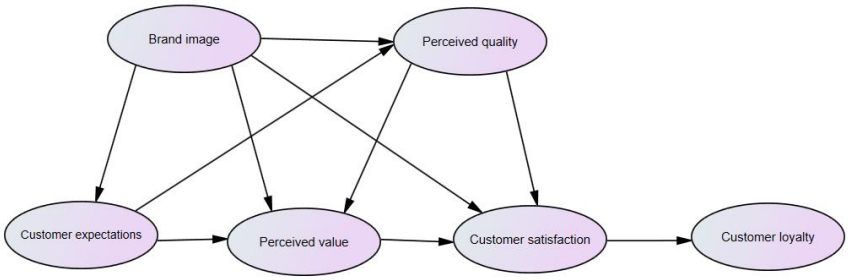

Figure 1 Structural Equation Model of New Energy Vehicle Buyers

For potential consumers who have not yet purchased new energy vehicles, a structural equation model is established based on the Stimulus-Organism-Response (S-O-R) model. This model conceptualizes the interactions between various factors that influence the purchasing intentions of these consumers. The "stimulus" components include the consumer's awareness of new energy vehicle products, evaluations of advertisements, and specific features of advertisements that catch consumer attention. The "organism" component is represented by the perceived value that these consumers attach to new energy vehicles. Finally, the "response" component is the purchasing intention of these potential buyers.

This model facilitates a detailed examination of how external marketing stimuli (product information and advertising) influence consumer perceptions (perceived value) and, consequently, their behavioral responses (purchasing intentions). The SEM thus provides insights into the efficacy of marketing strategies and the potential barriers to market entry for non-purchasers, helping to identify targeted interventions that could convert awareness and interest into actual sales.

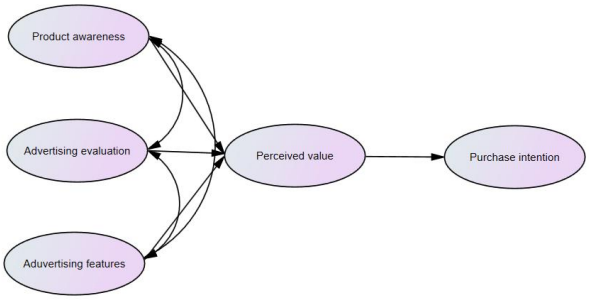

Figure 2 Structural Equation Model of Unpurchased New Energy Vehicles

3 DESCRIPTIVE ANALYSIS OF THE NEW ENERGY VEHICLE MARKET

3.1 Demographic Characteristics and Awareness Analysis of Respondents

After statistical analysis of the questionnaire data, the following conclusions can be drawn:

The respondents slightly skewed towards females, suggesting that different genders might prioritize and consider various factors differently when it comes to purchasing and experiencing new energy vehicles. These differences could be observed in the frequency of purchases, price points, brands, and the focal points during the experience. The age group of 18-30 years old is the most represented among the respondents, indicating that younger individuals are more interested in the topic of new energy vehicles. The predominant educational level is a bachelor's degree, with the majority of respondents being corporate employees. The monthly income of most respondents falls between 2,000 to 4,999 yuan, and there are more married respondents with children. Approximately 75% of respondents use private cars for commuting, highlighting a significant demand for driving as a mode of transportation. The data is summarized in the following table 4:

Table 4 Main Content and Proportions of Respondent's Basic Information

Basic Information	Details	Proportion
Gender	Female	54.94%
Education Level	Bachelor's Degree	44%
Occupation	Corporate Employee	26%
Monthly Income	2,000 to 4,999 RMB	31.76%
Marital and Parental Status	Married with Children	59.66%
Behavioral Trait	Drives a Private Car	75.54%

The analysis of the survey data shows that 95.28% of respondents have a general or better understanding of new energy vehicles, indicating a high level of awareness among the population. Most people are familiar with the concept of new energy vehicles.

Channels through which information about new energy vehicles is obtained:

The majority of respondents become aware of new energy vehicles through shopping websites, offline promotions, and online advertisements. Given the rapid spread of information on digital platforms, it is advisable for new energy vehicle companies to leverage online platforms more extensively for their marketing efforts. However, the importance of offline promotional strategies should not be overlooked. A combination of online and offline marketing strategies could be optimal.

Analysis of the purchasing behavior regarding new energy vehicles:

The ratio of respondents who have not purchased to those who have purchased new energy vehicles is nearly 1:1. Among those who have purchased new energy vehicles, the primary reasons identified for their purchase are commuting to work and for leisure travel, such as road trips. This insight can guide marketing strategies, emphasizing the convenience and utility of new energy vehicles for daily commutes and recreational purposes.

3.2 Interaction Analysis Between Demographic Groups and Purchase Rates

3.2.1 Analysis of differences in purchase rates of new energy vehicles

To explore the relationship between purchasing new energy vehicles and various demographic factors such as gender, age, education, occupation, monthly income, and marital and parental status, chi-square tests and contingency table analysis are employed. Objective: The purpose of these statistical tests is to determine if there are significant differences in the rates of purchasing new energy vehicles among different demographic groups based on their basic information; Hypothesis Testing: Null Hypothesis (H0): There is no significant influence of demographic variables (gender, age, education, occupation, monthly income, marital and parental status) on the decision to purchase new energy vehicles.

Table 5 Chi-Square Test Results

Demographic Factor	Chi-Square Value	P-Value	Significance
Gender	1.243	0.265	Not significant
Age	29.870	***	Significant
Education	5.359	0.374	Not significant
Occupation	55.335	***	Significant
Monthly Income	29.963	***	Significant
Marital and Parental Status	44.089	***	Significant

*p<0.05 **p<0.01 ***p<0.001

Results of the Statistical Tests: The chi-square tests and contingency analyses reveal that age, occupation, monthly income, and marital and parental status significantly influence the purchase of new energy vehicles at a 5% significance level. This indicates that these factors have a statistically significant impact on the decision to buy new energy vehicles.

4 SATISFACTION ANALYSIS BASED on the EXISTING CONSUMER GROUP

4.1 Research Model Design

4.1.1 Indicator system and questionnaire design

This study employs a survey method to collect sample data. To ensure the effectiveness and scientific validity of the questionnaire, scales adopted from established measurements in related literature are used. The questionnaire is designed based on a three-tier consumer satisfaction measurement system: First-level indicators represent the latent variables in the model, which are the broad constructs or concepts that the study aims to measure but are not directly observable; Second-level indicators represent the manifest variables (observable variables) that are directly measurable and observable, serving as manifestations of the latent variables; Third-level indicators correspond to specific questions on the survey, which are designed to measure the manifest variables.

The observable values of each manifest variable are derived from the statistical results of the survey, forming a comprehensive measurement system of consumer satisfaction with new energy vehicles. This system includes six dimensions and 19 items, as shown in the table 6. The questionnaire uses a Likert 5-point scale for these 19 measurement items, with each level corresponding to scores from 1 to 5, ensuring the questionnaire's reliability.

Table 6 New Energy Vehicle Consumer Satisfaction Evaluation Indicator System

First Level (Latent Variables)	Second Level (Observable Variables)	Third Level (Specific Questions)
Brand Image	Brand Industry Reputation	XX1: I believe this brand has a good reputation within the industry.
	Brand Innovativeness	XX2: I think this brand is very innovative.
	Brand Favorability	XX3: I believe the quality and performance of this brand's vehicles are very good.
	Brand Trustworthiness	XX4: I believe this brand is trustworthy.
Perceived Value	Vehicle Usage Experience	JZ1: Compared to the current price level, your experience of using the vehicle.
	Product Price Perception	JZ2: Compared to the current level of vehicle performance, your perception of the product's price.
	Worth of Purchase	JZ3: Compared to traditional vehicles, do you think NEVs are still worth buying?
Customer Satisfaction	Overall Satisfaction	MY1: Overall, your satisfaction with NEVs, considering various

	Actual Effect vs. Expectations	factors. MY2: Compared to your expectations, your actual experience with NEVs.
Customer Loyalty	Willingness to Repurchase	ZC1: Would you be willing to purchase NEVs again in the future?
	Willingness to Recommend	ZC2: Would you recommend others to purchase NEVs?
Perceived Quality	Exterior Design Evaluation	ZL1: Please rate the exterior design based on your experience with NEVs.
	Vehicle Performance Evaluation	ZL2: Please rate the vehicle performance based on your experience with NEVs.
	Functionality Utility Evaluation	ZL3: Please rate the functionality and utility based on your experience with NEVs.
	Vehicle Safety Evaluation	ZL4: Please rate the vehicle safety based on your experience with NEVs.
	After-sales Service Evaluation	ZL5: Please rate the after-sales service based on your experience with NEVs.
	Internal Space Capacity Evaluation	ZL6: Please rate the internal space capacity based on your experience with NEVs.
Customer Expectations	Overall Effect Expectation Degree of Need Satisfaction	QW1: Before using NEVs, your expectation of the performance of NEVs. QW2: The degree to which you expect NEVs to meet your needs.

4.1.2 Research hypotheses

This section outlines the hypotheses developed for the study based on literature reviews and the theoretical framework established. These hypotheses will guide the empirical investigation into various aspects of consumer behavior and satisfaction with new energy vehicles.

H1: Brand Image and Perceived Quality

A brand presents consumers with the image of the company to which the product belongs and a series of product attributes, and brand image is the comprehensive reflection of the brand's constituent elements in people's psychology. The study by ANDREASSEN et al. [8] confirms that brand image has a positive impact on perceived quality. Based on the above literature, the following hypothesis is proposed: H1: Brand image has a positive impact on perceived quality.

H2: Brand Image and Customer Expectations

Hypothesis H2: Brand image has a positive effect on customer expectations. Grace Kavengi Onyancha [9] have noted that a positive brand image usually raises customer expectations regarding a product.

H3: Brand Image and Perceived Value

Hypothesis H3: Brand image has a positive impact on perceived value. Research by Ovchinnikov [10] supports the view that brand image and reputation positively correlate with perceived quality, which in turn enhances perceived value.

H4: Brand Image and Customer Satisfaction

Hypothesis H4: Brand image positively influences customer satisfaction. This relationship is supported by the findings of ANDREASSEN [11]and BLOEME [12], who suggest that brand image directly precedes customer satisfaction and subsequently affects customer loyalty.

H5: Customer Expectations and Perceived Quality

Hypothesis H5: Customer expectations positively influence perceived quality. This hypothesis is grounded in the notion that the anticipatory positive mindset of customers affects their evaluation of product quality and value, as indicated by Jiao Huifang [13].

H6: Customer Expectations and Perceived Value

Hypothesis H6: Customer expectations have a positive effect on perceived value, as described by Fornell [14], who likens expectations to a mirror reflecting the anticipated quality of a product.

H7: Perceived Quality and Perceived Value

Hypothesis H7: Perceived quality positively affects perceived value. Higher perceived quality at a given price level enhances the perceived value of a product, as this direct relationship significantly influences customer satisfaction assessments [15].

H8: Perceived Quality and Customer Satisfaction

Hypothesis H8: Perceived quality has a positive impact on customer satisfaction. This idea is supported by Zeithaml [16] and Fornell [17], who view perceived quality as a critical determinant of overall satisfaction.

H9: Perceived Value and Customer Satisfaction

Hypothesis H9: Perceived value positively influences customer satisfaction. The core of perceived value involves a trade-off between perceived gains and losses, and its impact on satisfaction is well-documented by researchers like Woodruf [18].

H10: Customer Satisfaction and Customer Loyalty

Richard L. Oliver [19] believes that customer satisfaction refers to the feeling of pleasure or disappointment formed by a customer after comparing the perceived effects of a certain product or service with his/her expectations, while customer loyalty is a deep commitment of a customer to a preferred product or service, which will lead to repeated purchases of the same brand of products[20].

4.2 Empirical Analysis

4.2.1 Description of sample characteristics

The effective sample consists of 233 respondents who have purchased new energy vehicles. The gender distribution among respondents is 45.6% male and 54.94% female. The age of respondents is primarily concentrated in the 18-30 age range, accounting for 41.63% of the total, while those over 30 years old make up 58.37% of the respondents.

In terms of educational background, a significant majority, 78.97%, have completed at least an associate degree. The primary occupations among the respondents are corporate employees (26.18%) and students (21.03%). The monthly income level of most respondents is between 2,000 to 4,999 yuan. Regarding marital and parental status, 69.96% of respondents are married, with the number of married individuals with children being approximately six times that of those without children.

Overall, the demographic profile of the respondents who have purchased new energy vehicles indicates a group characterized by youth, higher education, and higher income levels.

The specific details are summarized in the table 7:

Table 7 Characteristics of User Sample Distribution

Variable	Option	Frequency	Percentage
Gender	Male	105	45.06%
	Female	128	54.94%
Age	18-30 years	97	41.63%
	31-40 years	44	18.88%
	41-50 years	50	21.46%
	Over 50 years	42	18.03%
Education Level	Junior high and below	13	5.58%
	High school or vocational	34	14.59%
	Associate degree	60	25.75%
	Bachelor's degree	102	43.78%

	Graduate degree	12	5.15%
	Doctorate and above	12	5.15%
Occupation	Government/Institution/Party-government staff	14	6.01%
	Professional technicians (teachers, doctors, etc.)	26	11.16%
	Service industry personnel (third sector)	20	8.58%
	Agricultural workers	7	3%
	Drivers (e.g., rideshare, taxi drivers)	12	5.15%
	Individual business owners	13	5.58%
	Corporate employees	61	26.18%
	Students	49	21.03%
	Retired	0	0%
	Others (unemployed, etc.)	31	13.3%
Monthly Income	Below 2000 RMB	65	27.9%
	2000-4999 RMB	74	31.76%
	5000-9999 RMB	52	22.32%
	10,000-50,000 RMB	28	12.02%
	Above 50,000 RMB	14	6.01%
Marital and	Unmarried	70	30.04%
Parental Status	Married without children	24	10.3%
	Married with children (age of children not specified)	139	59.66%

4.2.2 Validity analysis

4.2.2.1 Convergent validity test

Traditionally, researchers have used the internal consistency coefficient (Cronbach's alpha) as a measure of scale reliability. With the adoption of structural equation modeling, the construct reliability (CR) is typically employed to describe the reliability of scales. The table below lists the outputs from the model, including standardized factor loadings (STD), standard errors (S.E.), the ratio of standardized factor loadings to standard error, and significance levels (p-value). From these standardized factor loadings, one can calculate the squared standardized coefficients (SMC), construct reliability (CR), and average variance extracted (AVE).

To assess convergent validity, researchers focus on two metrics: Composite Reliability (CR) and Average Variance Extracted (AVE). Initially, the loading coefficients of the observed variables for each latent variable in the measurement model are estimated. The factor loadings are expected to fall within the acceptable range of 0.5 to 0.95. In this model, it was observed that the loadings for ZL1, ZL2, and JZ2 were below 0.5, prompting a model revision. These paths were sequentially removed starting with the lowest loading coefficient. After the modifications, the revised model was subjected to a convergent validity test.

If the AVE is less than 0.5 but the CR is greater than 0.6, the validity of the structure is still considered adequate, suggesting that the consistency among the measurement variables is acceptable.

Using AMOS 26.0 to compute these indicators, it was found that the AVE for most dimensions was above 0.5. Although the AVE for the perceived quality dimension was below 0.5, the CR values were all above 0.6, indicating acceptable reliability. This suggests that the data obtained from the questionnaire has good consistency and can be integrated into the model path diagram.

Table 8 Convergent Validity Test

		Significance Estimation				Item Reliability		Composite Reliability	Convergent Validity
dimension	items	Unstd	S.E.	z-value	Std.	P	SMC	CR	AVE

	XX1	0.702	1.000				0.493		
brand	XX2	0.687	1.331	0.129	10.308	***	0.472	0	0.523
image	XX3	0.788	1.005	0.114	8.83	***	0.621		
	XX4	0.711	1.112	0.112	9.935	***	0.506		
	ZL1	0.701	1.025	0.107	9.57	***	0.491		
	ZL2	0.715	0.974	0.102	9.575	***	0.511		
perception	ZL3	0.801	1.000				0.642	0.891	0.577
quality	ZL4	0.781	1.142	0.107	10.656	***	0.610		
	ZL5	0.781	1.113	0.107	10.407	***	0.610		
	ZL6	0.773	1.091	0.105	10.409	***	0.598		
Customer	QW1	0.698	1.000				0.487	0.650	0.481
expectations	QW2	0.689	0.857	0.089	9.656	***	0.475		
Perceived value	JZ1	0.792	1.000				0.627		
	JZ2	0.856	1.219	0.123	9.881	***	0.733	0.828	0.618
	JZ3	0.702	1.065	0.119	8.916	***	0.493		
Customer	MY1	0.908	1.000				0.824	0.910	0.835
satisfaction	MY2	0.92	1.094	0.059	18.448	***	0.846		
Customer	ZC1	0.887	1.000				0.787	0.785	0.649
loyalty	ZC2	0.715	0.954	0.046	20.617	***	0.511		

*p<0.05 **p<0.01 ***p<0.001

4.2.2.2 Discriminant validity test

Discriminant validity assesses the extent to which a construct is truly distinct from other constructs by low correlations with other variables. It is evaluated by comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlation coefficients between the construct and all other constructs. If the square root of the AVE for a construct is greater than its correlations with other constructs, then it exhibits good discriminant validity.

The following table (hypothetical data representation) illustrates this concept, where the bold figures represent the square roots of the AVEs, which are consistently higher than the correlation coefficients in their respective columns. This indicates appropriate discriminant validity for the measurement model used in this study.

Table 9 Discriminant Validity Test

Construct	AVE	Brand Image	Customer Expectations	Perceived Quality	Perceived Value	Customer Satisfaction	Customer Loyalty
Brand Image	0.523	0.723					
Customer Expectations	0.481	0.497	0.694				
Perceived Quality	0.577	0.307	0.251	0.760			
Perceived Value	0.618	0.426	0.892	0.317	0.786		
Customer Satisfaction	0.835	0.126	0.087	0.031	0.071	0.914	
Customer Loyalty	0.649	0.151	0.104	0.037	0.085	1.435	0.806

Note: The bold numbers on the diagonal represent the root of AVE, and the lower triangle represents the Pearson correlation coefficient of the structural plane.

4.2.2.3 Model fit test

Model fit tests are used to evaluate how well a hypothesized model matches the actual collected data. Utilizing AMOS 26.0 for testing the fit of the theoretical model, the results are as follows: Chi-Square (χ^2) Value: 240.182, Degrees of

Freedom (DF): 171, Chi-Square/Degrees of Freedom Ratio (CMIN/DF): 2.167, P-value: <0.001, Goodness of Fit Index (GFI): 0.876, Root Mean Square Error of Approximation (RMSEA): 0.075, Comparative Fit Index (CFI): 0.929, Tucker-Lewis Index (TLI): 0.914.

Conclusion: The model's fit indices are within the standard ranges, suggesting that the model fits the data reasonably well. This indicates that the theoretical constructs and the relationships among them are appropriately modeled according to the data obtained. These results suggest that the structural model is robust and reliably represents the theoretical understanding of the phenomena being studied.

Table 10 Structural Equation Model Fit Indices and Results

Index	Model Fit Value	Evaluation Standard	Conclusion
CMIN (Chi-Square)	307.751	<3 Excellent; <5 Acceptable	Fit not ideal
DF (Degrees of Freedom)	172	>0.9 Excellent; >0.8 Acceptable	Fit not ideal
CMIN/DF	2.167	<3 Excellent; <5 Acceptable	Good fit
GFI (Goodness of Fit Index)	0.876	>0.8 Acceptable; >0.9 Excellent	Acceptable
AGFI (Adjusted Goodness of Fit Index)	0.833	>0.8 Acceptable; >0.9 Excellent	Acceptable
RMSEA (Root Mean Square Error of Approximation)	0.075	<0.08 Excellent	Good fit
CFI (Comparative Fit Index)	0.929	>0.9 Excellent	Good fit
TLI (Tucker-Lewis Index)	0.914	>0.9 Excellent	Good fit

4.3 Structural Equation Model Results and Analysis

4.3.1 Model estimation results

By classifying relevant indicators and processing the data accordingly, preliminary model fitting is carried out, and relevant parameter estimation and continuous correction are carried out to ultimately determine the structural model. The corresponding standardized path coefficient diagram of the structural equation model is simulated and drawn, as shown in the following figure 3.

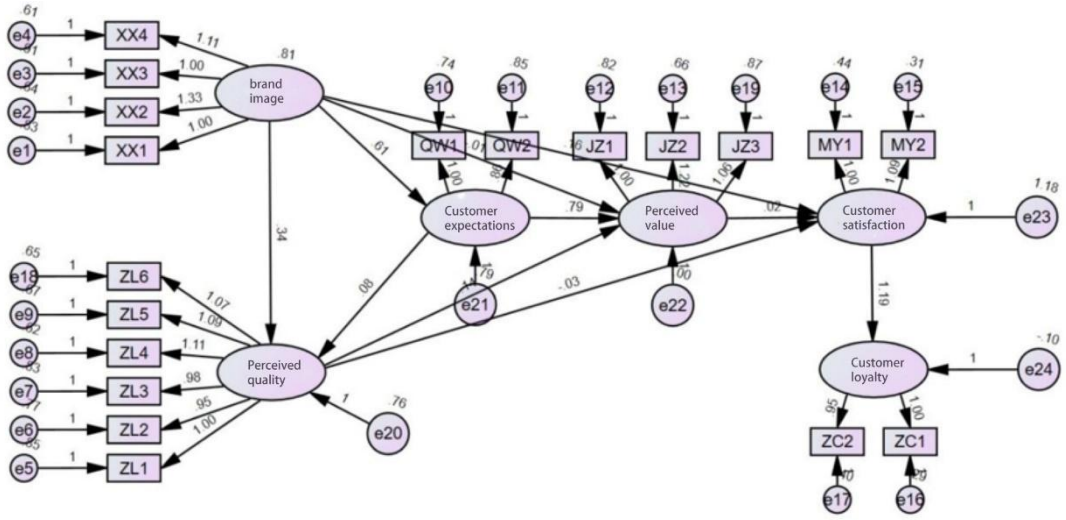

Figure 3 Standardized path coefficient diagram of structural equation model

In the case where the reliability, validity, and model fit of the scale are acceptable, further testing is conducted on the significance of the path coefficients between each latent variable in the structural model. The model path test results are shown in the table below. Assuming a significance level of 0.05, 5 out of 10 paths of 6 latent variables have a significant P-value below 0.05. Combined with the standard coefficients, it indicates that the paths of hypothesis H1

"brand image has a positive impact on perceived quality", H2 "brand image has a positive impact on customer expectations", H6 "customer expectations have a positive impact on perceived value", and H10 "customer satisfaction has a positive impact on customer loyalty" are significant and the hypothesis is valid; Assuming that H3 "brand image has a positive impact on perceived value", H4 "brand image has a positive impact on customer satisfaction", H5 "customer expectations have a positive impact on perceived quality", H8 "perceived quality has a positive impact on customer satisfaction", and H9 "perceived value has a positive impact on customer satisfaction", the P-value results are 0.901, 0.196, 0.395, 0.890, and 0.790, respectively, which do not meet the requirement of 0.05. Therefore, these five paths are not significant. Assuming that H3, H4, H5, H8, and H9 are rejected.

Table 11 Results of Standardized Path Coefficients for Structural Equation Model

Hypothesis	Path	Standard Coefficient	P-value	Result
H1	Brand Image → Perceived Quality	0.332	**	Supported
H2	Brand Image → Customer Expectations	0.614	***	Supported
H3	Brand Image → Perceived Value	-0.011	0.901	Not Supported
H4	Brand Image → Customer Satisfaction	0.157	0.196	Not Supported
H5	Customer Expectations → Perceived Quality	0.079	0.395	Not Supported
H6	Customer Expectations → Perceived Value	0.785	***	Supported
H7	Perceived Quality → Perceived Value	0.145	*	Supported
H8	Perceived Quality → Customer Satisfaction	0.018	0.890	Not Supported
H9	Perceived Value → Customer Satisfaction	-0.027	0.790	Not Supported
H10	Customer Satisfaction → Customer Loyalty	1.193	***	Supported

*p<0.05 **p<0.01 ***p<0.001

4.3.2 Analysis of measurement results

4.3.2.1 Latent variable analysis

a. Brand Image

There is a negative correlation between brand image and customer satisfaction.

The results show that the negative correlation coefficient between the two is relatively high, indicating that brand image is just an initial impression of the product brand in the consumer's mind.

For companies to achieve a win-win situation in both reputation and profits, they need to focus on product value to improve customer satisfaction.

b. Perceived Quality

There is a negative correlation between perceived quality and customer satisfaction.

The results show a relatively high negative correlation coefficient between the two, indicating that when the newly introduced new energy vehicles (NEVs) receive low ratings in terms of functionality, ease of operation, reliability, and after-sales service, they cannot directly influence customer satisfaction.

c. Perceived Value

There is a negative correlation between perceived value and customer satisfaction.

The results show that the impact between the two is significant, implying that companies need to emphasize the advantages of their products and expand their competitiveness to stand out among the many vehicle types.

d. Customer Loyalty

There is a positive correlation between customer loyalty and customer satisfaction.

The results show a significant positive correlation coefficient between the two, indicating that customer satisfaction and loyalty are closely related. Customer loyalty is the embodiment of customer satisfaction, laying the foundation for sustainable value for the company.

4.3.2.2 Path coefficient analysis

There are two main paths influencing customer satisfaction with new energy vehicles:

Path 1: Brand Image → Customer Expectations → Perceived Quality → Customer Satisfaction → Customer Loyalty; Path 2: Brand Image → Perceived Quality → Customer Satisfaction → Customer Loyalty. Comparative Analysis of Path 1 and Path 2: The positive influence coefficient of brand image on customer expectations is 0.614, while the positive influence coefficient of customer expectations on perceived quality is 0.079. The positive influence coefficient of brand image on perceived quality is 0.332. Thus, customer expectations partially mediate the relationship between brand image and perceived quality. According to the path coefficient results, the path "Brand Image → Customer Satisfaction" is not significant, whereas "Perceived Quality → Customer Satisfaction" is significant. Therefore, perceived quality fully mediates the relationship between brand image and customer satisfaction.

The hypothesis that customer expectations positively affect perceived value is not supported, mainly because customer expectations about the quality and functions of NEVs before purchasing cannot be compared with their actual post-use experiences. Thus, customer expectations cannot directly influence customer satisfaction.

The positive impact of perceived value on customer satisfaction is not significant. This may be because, compared to traditional vehicles, NEVs lack notable convenience and functionality, making it difficult to significantly influence customer satisfaction.

The most significant path affecting NEV customer satisfaction in this study is "Brand Image → Customer Expectations → Perceived Quality → Customer Satisfaction → Customer Loyalty. "This suggests that when customers perceive NEVs as having a high level of quality, their satisfaction increases. Customers who are very satisfied with NEVs are more likely to repurchase and recommend them to others, thus positively influencing customer loyalty. Overall, focusing on and improving customer perception of NEV quality is crucial to enhancing customer satisfaction.

5 ANALYSIS of PURCHASE INTENTIONS AMONG NON-CONSUMERS

5.1 Descriptive Statistical Analysis of Non-Purchasing Population

The statistical analysis of survey data from non-purchasers yields the following insights:

Awareness Levels: Non-purchasers have a good understanding of the design philosophy, price levels, advantages and disadvantages, and differences between new energy vehicles (NEVs) and traditional vehicles. Over 70% of non-purchasers indicated in the questionnaire that they have a general or better understanding of these aspects.

Online Reviews: The majority of respondents stated that online platforms were effective in helping them understand NEVs, and that the content was accurate and reliable.

Advertising Characteristics: Approximately 78% of respondents indicated that they could see NEV advertisements, and around 73% expressed that the advertisements were persuasive.

Reasons for Not Purchasing:

The primary reasons non-purchasers cited for not buying NEVs were concerns about safety and a perception that the cost-performance ratio was not high enough.

More non-purchasers wish to see improvements in the price and battery life of NEVs.

Overall, understanding these preferences and concerns is crucial for NEV manufacturers to refine their product and marketing strategies, potentially converting these non-purchasers into loyal customers.

5.2 Analysis of Consumer Purchase Intentions Based on the S-O-R Model

5.2.1 Theoretical model and hypotheses

5.2.1.1 S-O-R theoretical model

The Stimulus-Organism-Response (S-O-R) model originates from psychology and explains how environmental characteristics influence user behavior and psychological activities. In this model: S (Stimulus) represents external environmental stimuli that impact the individual. O (Organism) represents the cognitively aware organism. R (Response)

refers to the behavioral responses generated by the individual after experiencing psychological activities following the external environmental stimuli, such as acceptance or rejection, adoption or avoidance.

In simple terms, external environmental factors influence an individual's cognition and emotional state, which then impact their behavior.

Drawing on research findings from management, information science, psychology, and other fields, this paper applies the S-O-R model to study consumers' purchase intentions for new energy vehicles (NEVs). The external stimuli include product awareness, online reviews, and advertising characteristics that affect the organism (the consumer). The organism then processes these stimuli, forming perceptions and attitudes, leading to responses such as willingness to purchase NEVs or not.

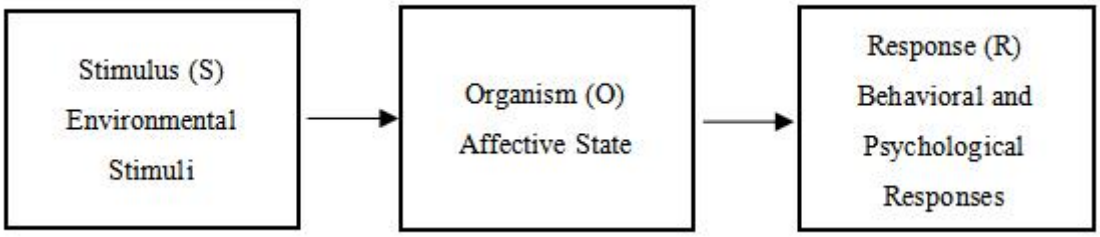

Figure 4 S-O-R Theoretical Model

5.2.2 Research hypotheses

5.2.2.1 Product awareness

Product awareness refers to the level of knowledge that a prospective or existing customer has about the services and functions of a product. It is measured by consumer attention and recognition. According to relevant literature, all consumer behavior is based on their understanding and knowledge of a product. Users form subjective judgments based on their perceived results, which can determine their value assessment of the product. Therefore, the following hypothesis is proposed:

H1: Product awareness positively influences customer perceived value.

5.2.2.2 Online reviews

Online reviews are common and important information cues in the online environment that provide feedback on product performance and usage. Consumers often use online reviews to assess the quality and value of a product. The higher the level of product reviews, the stronger the consumer's perceived trust and the more likely they are to maximize the perceived value, thus influencing their purchasing decision. Based on the above, the following hypothesis is proposed:

H2: Online reviews positively influence customer perceived value.

5.2.2.3 Advertising characteristics

Advertising refers to a communication method that delivers brand image information to target customers through multimedia, television, radio, telephone, and other media. In studies on customer value transfer strategies in online advertising operations, it is found that advertising can affect consumers' perceived value and thereby help companies profit through value transfer (purchasing behavior). From the customer's perspective, research on the application of advertising strategies in brand building shows that advertising has a strong positive impact on consumers' perceived value. Based on the above, the following hypothesis is proposed:

H3: Advertising characteristics positively influence customer perceived value.

5.2.2.4 Perceived value

Purchase intention refers to the likelihood that consumers will engage in a particular purchasing behavior and is generally used to predict consumer purchasing behavior. Customer perceived value reflects the customer's subjective perception of the value of the product or service provided by the company. The higher the perceived value, the stronger the consumer's purchase intention, and the more likely it is to lead to purchasing behavior. In studies using the S-O-R model on the influence of price and evaluation on consumer purchase intention, the results show that consumer

perceived value significantly positively influences their purchase intention. Based on the above, the following hypothesis is proposed:

H4: Customer perceived value positively influences purchase intention.

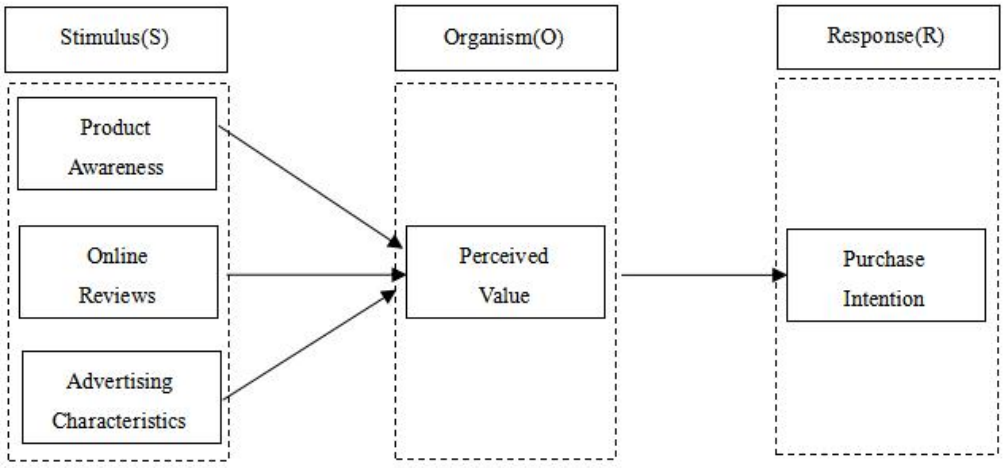

Figure 5 S-O-R research model

5.2.3 Questionnaire scale design

This study collects sample data through a questionnaire survey. To ensure the validity and scientific rigor of the questionnaire, the scale was designed based on existing mature scales and the definitions of each variable in the model. The final design includes 5 dimensions and 1 measurement item per dimension. All items are rated on a 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree," with scores from 1 to 5.

Table 12 Questionnaire Scale Design

Variable Name	Code	Item Content
Product Awareness	RZ1	I understand the product's design philosophy.
	RZ2	I understand the price level of new energy vehicles.
	RZ3	I understand the pros and cons of new energy vehicles.
	RZ4	I understand the differences between new energy vehicles and traditional vehicles.
Advertising	TZ1	I often see advertisements for new energy vehicles.
Characteristics	TZ2	I find the advertisements for new energy vehicles attractive.
Online Reviews	PJ1	I believe that user reviews on online platforms are genuine.
	PJ2	I think online reviews help me better understand new energy vehicles.
Purchase Intention	YY1	I think new energy vehicles are worth purchasing.
	YY2	I will consider purchasing new energy vehicles in the future.
	YY3	I prefer new energy vehicles over traditional vehicles.
Perceived Value	JZ1	I believe that new energy vehicles can meet my usage needs.
	JZ2	I believe that new energy vehicles offer high cost-effectiveness.
	JZ3	I believe that new energy vehicles are excellent.

5.3 Empirical Analysis

5.3.1 Discriminant validity test

As shown in the table below, the bold values in each column are greater than the other values in that column, indicating that the questionnaire's variable scales have good discriminant validity.

Table 13 Discriminant Validity Test Results

Variable	Online Reviews	Advertising Characteristics	Product Awareness	Perceived Value	Purchase Intention
Online Reviews	0.795				
Advertising Characteristics	0.716	0.662			
Product Awareness	0.596	0.462	0.988		
Perceived Value	0.613	0.614	0.368	0.790	
Purchase Intention	-0.005	-0.005	-0.003	-0.007	1.246

The purpose of conducting a model fit test is to compare the fit of the model results to the actual situation. In empirical research, the following six indicators are commonly used to analyze the degree of fit between the theoretical model and the actual data: chi-square to degrees of freedom ratio (CMIN/DF), GFI, CFI, TLI, IFI, and RMSEA. Results: Chi-Square/DF (CMIN/DF): 1.412 ($p < 0.05$); CFI (Comparative Fit Index): 0.981; GFI (Goodness of Fit Index): 0.904; IFI (Incremental Fit Index): 0.981; TLI (Tucker-Lewis Index): 0.871; RMSEA (Root Mean Square Error of Approximation): 0.057.

Table 14 Structural Equation Model Fit Indices and Results

Index	Model Fit Value	Evaluation Standard	Conclusion
CMIN/DF	4.423	<3 Excellent; <5 Reasonable	Good Fit
GFI	0.904	>0.9 Excellent; >0.8 Reasonable	Excellent Fit
CFI	0.901	>0.9 Excellent; >0.8 Reasonable	Excellent Fit
IFI	0.901	>0.9 Excellent; >0.8 Reasonable	Excellent Fit
TLI	0.871	>0.9 Excellent; >0.8 Reasonable	Good Fit
RMSEA	0.057	<0.05 Excellent; <0.08 Reasonable	Good Fit

5.3.2 Model fit results and analysis

Using AMOS 24.0 software, the final S-O-R model results are obtained as shown in the Figure 6, where the numbers represent the path coefficients.

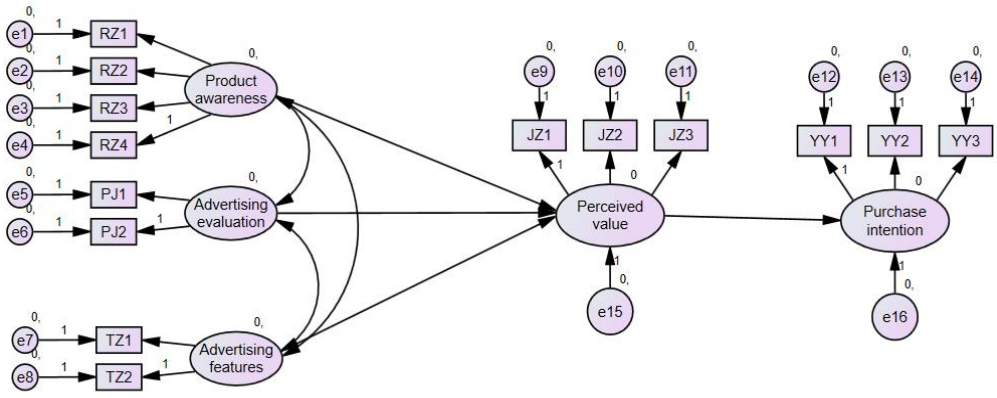

Figure 6 Standardized path coefficient diagram of S-O-R model

5.3.2.1 Research findings

Based on the results and combining the P-values with the standard coefficients, the hypotheses H1 ("Product awareness positively influences customer perceived value"), H2 ("Online reviews positively influence customer perceived value"), and H4 ("Customer perceived value positively influences purchase intention") are supported. However, H3 ("Advertising characteristics positively influence customer perceived value") is not supported.

Table 15 Main Effect Test Results for S-O-R Model

Hypothesis	Path	Standard Coefficient	P-value	Result
H1	Product Awareness → Perceived Value	0.679	**	Supported
H2	Online Reviews → Perceived Value	0.641	**	Supported
H3	Advertising Characteristics → Perceived Value	-0.514	0.189	Not Supported
H4	Perceived Value → Purchase Intention	0.580	***	Supported
	Product Awareness ↔ Online Reviews	0.225	***	
	Product Awareness ↔ Advertising Characteristics	0.212	***	
	Online Reviews ↔ Advertising Characteristics	0.414	***	

*p<0.05 **p<0.01 ***p<0.001

5.3.2.2 Research conclusions

This study, based on the S-O-R environmental psychology model and previous research, explores the mechanisms influencing consumers' purchase intentions for new energy vehicles (NEVs). By analyzing questionnaire data, the related hypotheses were verified, leading to the following conclusions:

1. Impact of Stimuli on Organism

Product awareness and online reviews both have a significant positive impact on consumers' perceived value. Advertising characteristics negatively influence consumers' perceived value.

2. Impact of Organism on Response

Perceived value positively influences purchase intention.

3. Internal Interactions Among Stimuli

Product awareness, online reviews, and advertising characteristics interact with each other.

5.4 Mining Potential Consumer Characteristics Based on K-means Clustering

5.4.1 Model selection and establishment

5.4.1.1 Definition of potential consumers

Potential consumers refer to individuals who currently do not purchase or use new energy vehicles but may convert into actual consumers at some point in the future.

5.4.1.2 Establishment of potential consumer model

Using questionnaire data, the most valuable potential consumers are identified and mined through clustering analysis. First, respondents who chose "Yes" to the question "Have you purchased a new energy vehicle?" are excluded. Next, respondents who chose "Neutral," "Agree," or "Strongly Agree" to the question "I will consider purchasing a new energy vehicle in the future" are selected.

Therefore, this filtered group consists of people who have not purchased or used new energy vehicles but have a purchase intention. We define these individuals as potential consumers, totaling 102 people.

5.4.2 Model application and analysis

5.4.2.1 Selection of clustering factors

Based on the results of previous studies, seven factors were selected from the survey questionnaire as clustering indicators: gender, age, highest educational level, occupation, monthly income, marital and parental status, and reasons for not purchasing new energy vehicles.

Since these seven indicators are not numeric, they are converted into numerical variables. Clustering analysis groups samples based on distances between them, so these eight indicators are assigned values, such as "1, 2, 3, 4,...".

5.4.2.2 Determining the number of clusters using principal components analysis

Principal component analysis (PCA) reflects the proportion of variance in the data explained by each principal component. This proportion indicates the amount of information from the original data included. As shown in the table below, three principal components were retained. The first principal component contributes 36.789%, while the second

and third principal components contribute 18.646% and 15.387% of the information from the seven original variables, respectively.

The cumulative contribution rate of the first three principal components reaches 70.822%, which exceeds 70%. Thus, it is appropriate to retain three principal components.

Table 16 Total Variance Explained

Ingredients	Initial eigenvalue			Extracting the sum of squared loads		
	Total	Variance percentage	Accumulated	Total	Variance percentage	Accumulated
1	2.575	36.789	36.789	2.575	36.789	36.789
2	1.305	18.646	55.435	1.305	18.646	55.435
3	1.077	15.386	70.822	1.077	15.386	70.822
4	0.896	12.801	83.623			
5	0.642	9.177	92.799			
6	0.380	5.423	98.222			
7	0.124	1.778	100.000			

Extraction method: Principal component analysis.

5.4.2.3 Potential consumer value model based on clustering results

1) Clustering Results

Based on the results of principal component analysis, the K-means clustering method was applied using SPSS 26.0 to categorize potential new energy vehicle (NEV) consumers into three groups. The results are shown in the following table 17.

Table 17 Cluster Structure

	clustering		
	Cluster I	Cluster II	Cluster III
Gender	2	1	2
Age	1	3	2
Education Level	3	4	4
Occupation	8	2	7
Monthly Income	1	3	3
Marital and Parental Status	1	3	3
Main Reason for Not Purchasing NEVs	6	3	2

The values assigned to each option are converted back to the original option data in each cluster. The detailed results are as table 18.

Table 18 Original Data After Clustering

Potential Consumer Type	Cluster I	Cluster II	Cluster III
Gender	Female	Male	Female
Age	18-30 years	41-50 years	31-40 years
Education Level	Associate Degree	Bachelor's Degree	Bachelor's Degree
Occupation	Student	Third Sector Service Staff	Corporate Employee
Monthly Income	Below 2000 RMB	5000-9999 RMB	5000-9999 RMB
Marital and Parental Status	Unmarried	Married with Children	Married with Children
Main Reason for Not Purchasing	No Demand	Concerned About NEV Safety	High Product Price

NEVs

By analyzing the number of cases of three types of potential consumers and calculating their proportions, the results are shown in the table 19.

Table 19 Cluster Case Counts (n=102)

Cluster Type	Cluster Case Count	Proportion
I	49	48.04%
II	25	24.51%
III	28	27.45%

2) Potential Consumer Value Analysis

Analyze the characteristics of potential consumers based on the clustering structure, analyze the characteristics of three types of potential consumers, and then summarize the group characteristics of each category.

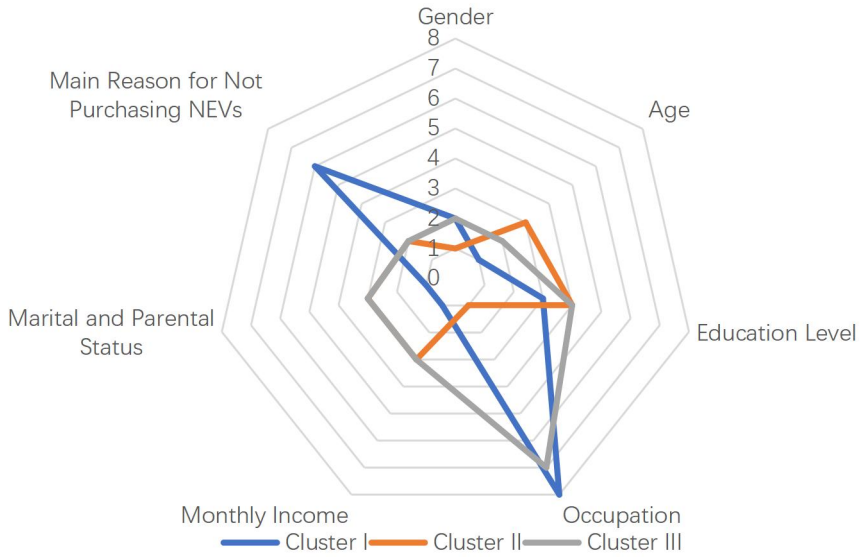

Figure 7 Feature analysis diagram

Based on the characteristic analysis, it can be observed that potential consumers of each type possess distinct features, indicating significant differences among them. Based on these feature profiles, we categorize potential consumers into three groups: Important Development Consumers, General Potential Consumers, and Low-Value Potential Consumers, with each type of potential consumer characterized as follows:

Important Development Consumers: Representing the third category of potential consumers, this group consists of females aged 31-40, holding undergraduate degrees, employed as corporate staff, with a monthly income ranging from 5000 to 9999 RMB. They are married with children and perceive the prices of new energy vehicles as excessively high. As working professionals, it is imperative to consider the demographic characteristics of this group when promoting new energy vehicles. Emphasizing the cost-effectiveness of the products could stimulate consumption within this demographic.

General Potential Consumers: Representing the second category of potential consumers, this group comprises males aged 41-50, holding undergraduate degrees, with a monthly income ranging from 5000 to 9999 RMB. They are employed in the tertiary sector and are married with children. Their primary reason for not purchasing new energy

vehicles is concerns regarding their safety. In addressing this group, companies should intensify their promotional efforts for new energy vehicles, enhancing awareness and understanding among this demographic to dispel safety concerns and foster their willingness to purchase and utilize such vehicles.

Low-Value Potential Consumers: Representing the first category of potential consumers, this group consists of female students aged 18-30 with a monthly income below 2000 RMB, indicating a low-income level. They lack surplus disposable income to support the purchase of new energy vehicles. Furthermore, as most students lead campus-centered lives, their demand for new energy vehicles is minimal, and they exhibit little inclination to make purchases. Consequently, the value of this customer segment is limited.

5.5 Model Analysis Summary

In summary, the main conclusions drawn from the analysis of potential user value are as follows:

Firstly, through the clustering and characteristic analysis of potential consumers, it is found that approximately 27.45% of potential consumers are Important Development Consumers, while 24.51% are General Potential Consumers, making up a total of 51.96% of potential consumers who are relatively inclined to purchase new energy vehicles. These two consumer groups should be regarded as the long-term target audience for new energy vehicles. Marketing efforts should be tailored to address the reasons for their non-purchase behavior, aiming to better meet the needs of these two consumer segments.

Secondly, 48.04% of potential consumers are classified as Low-Value Potential Consumers. While some of these consumers are essentially silent customers, new energy vehicle companies should still pay attention to them. Even though this group has minimal demand for new energy vehicles, promotional efforts can still be directed towards them, thereby facilitating a preliminary transition from low-value consumers to general-value consumers.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This chapter combines relevant literature with descriptive analysis based on questionnaire data and model analysis results to draw conclusions and provide targeted recommendations. In today's Guangxi new energy vehicle market, under the guidance of new productive forces, emerging forces are continuously emerging, and an increasing number of consumers are expecting new energy vehicles to deliver superior performance. Based on the survey data presented in the questionnaire, the following conclusions are drawn:

Firstly, through chi-square tests, it is determined that age, occupation, monthly income, and marital and parental status significantly influence the purchase of new energy vehicles. Older age groups tend to have more new energy vehicle users, while industries with higher incomes such as corporate employees and drivers (passenger transport) have a higher proportion of new energy vehicle users. The purchase rate of new energy vehicles is also higher among married individuals with children.

Secondly, purchasers of new energy vehicles prioritize technological innovation and functionality. They tend to prefer new technologies introduced by emerging brands. Current purchasers generally have stable evaluations of various aspects of new energy vehicles. However, as the automotive market develops, new energy vehicles need to break through in terms of features. Only 26% of current purchasers intend to continue buying new energy vehicles, and only 22% express high confidence in the market prospects of new energy vehicles. Therefore, continuous breakthroughs in various aspects are necessary to better meet purchasers' needs. Structural equation modeling indicates that customers' perception of high quality in new energy vehicles is key to improving customer satisfaction, which in turn positively influences repeat usage intentions and recommendations to others, thus enhancing customer loyalty. Therefore, focusing on and improving customers' perception of the quality of new energy vehicles is a crucial factor in enhancing customer satisfaction.

Thirdly, the main reason for the non-purchase among the unconsumed population is concern about the safety of new energy vehicles. To increase the number of new energy vehicles purchased by consumers, improvements are needed in safety, battery life, cost-effectiveness, etc. Additionally, 81% of potential purchasers hope for improved performance of new energy vehicles. According to the S-O-R structural equation model, product awareness and online evaluations positively affect perceived value among potential consumers, which in turn significantly influences purchase intentions. Product awareness, online evaluations, and advertising characteristics also have mutual positive effects.

Through clustering analysis of potential consumers' characteristics, it is found that approximately 27.45% of potential consumers are Important Development Consumers, while 24.51% are General Potential Consumers, totaling 51.96% of potential consumers who are relatively inclined to purchase new energy vehicles. These two consumer groups should be regarded as the long-term target audience for new energy vehicles, with targeted marketing efforts addressing the reasons for their non-purchase behavior to better meet their needs. Additionally, 48.04% of potential consumers are Low-Value Potential Consumers. Although some of these consumers are essentially silent customers, new energy vehicle companies should still pay attention to them. Even though this group has minimal demand for new energy vehicles, promotional efforts can still be directed towards them to facilitate a preliminary transition from low-value consumers to general-value consumers.

6.2 Recommendations

The new productive forces rely on new technologies such as digitization, networking, and intelligence, emphasizing the deep application of high-tech and causing revolutionary impacts on the socio-economy. This study can provide strategic guidance for enterprises and governments on how to implement and adapt to new productive forces in the new energy vehicle industry, promoting its sustainable development and better serving the overall layout of new productive forces. From the perspectives of enterprises and governments, the following recommendations are proposed:

(1) Enterprises should leverage digitalization, networking, and intelligent technologies as the foundation, fully utilize cutting-edge technologies such as big data and artificial intelligence, to enhance the performance and user experience of new energy vehicles. Addressing the current challenges faced by the new energy vehicle industry such as the demand for technological innovation, market competition, and diverse consumer needs, enterprises should strengthen technological innovation and promote the upgrading of products and services. Specific recommendations include developing intelligent and personalized solutions for new energy vehicles, integrating advanced information and networking technologies to enhance the intelligence level of vehicles, such as intelligent driving assistance systems, and vehicle networking services. Additionally, enterprises should enhance cooperation with internet and big data companies to optimize data analysis and user experience, enabling personalized marketing and services. Furthermore, enterprises need to enhance the digital transformation of internal management and production processes to improve operational efficiency and flexibility, reduce costs, and enhance market competitiveness.

(2) Governments should promote the healthy development of the new energy vehicle industry and create a favorable environment for the realization of new productive forces. Addressing the development bottlenecks of the new energy vehicle industry such as inadequate infrastructure, inconsistent technical standards, and low market acceptance, governments should enact relevant policies and measures. Specific recommendations include increasing policy support and funding for the new energy vehicle industry, promoting the construction of charging stations and related infrastructure, improving new energy vehicle standards and regulatory systems, and promoting technological exchanges and the coordinated development of the industry. Moreover, governments should strengthen public education and awareness campaigns to enhance societal understanding and acceptance of new energy vehicles and the concept of new productive forces. Additionally, governments should encourage cooperation and competition among enterprises, support industry-academia-research collaboration, accelerate the research and application of new technologies, and promote innovation and upgrading in the new energy vehicle industry, thus serving the overall layout of new productive forces.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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