Journal of
Management and Humanity Research

Influencing Factors on Customer Buying Willingness of New Energy Vehicle

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Abstract. In 2022, China's new energy vehicles will become a bright spot in the Chinese auto market. In 2022, the sales and output of new energy vehicles in Shaanxi rank second in the country, and the growth rate of new energy vehicles in Shaanxi ranks first in the country. In 2022, Xi'an accounts for 99% of Shaanxi's new energy vehicle production. Therefore, it is necessary for this paper to conduct research on consumers' willingness to consume new energy vehicles in Xi'an, which will help find consumers' purchase needs and further increase the sales of new energy vehicles in Xi'an. The research found that: first, individual characteristics have a strong influence. Second, whether there is a big difference between whether there are cars. Third, the green concept leads the way. Fourth, the appearance of cars has little influence, and attention to the interior is fundamental, and supporting facilities are kept up. Fifth, restricted subsidies promote development.

Keywords: Influencing factor, Customer buying willingness, new energy vehicle, reliability, correlation coefficient; structural equation

1. Introduction

In 2022, China's new energy vehicles will become a bright spot in the Chinese auto market. According to data released by the China Association of Automobile Manufacturers, from January to November 2022, China's new energy vehicle production will be 6.253 million, a year-on-year increase of 1 times. From January to November 2022, sales of new energy vehicles in China will reach 6.067 million units, doubling year-on-year growth [1]. In 2022, China's new energy vehicles will achieve a year-on-year growth rate of 100%. China's new energy vehicles have achieved a 100% growth rate in exports. China's new energy vehicles have achieved a domestic market share of more than 25%. China's new energy vehicles have achieved a market share of nearly 50% for Chinese brands. According to financial

reports, China's new energy vehicles will continue to maintain rapid growth in 2023 [2-3] . Sales of new energy vehicles in China are expected to reach 9 million units, a year-on-year increase of 35%. Therefore, it is expected that in 2023, China's new energy vehicle sales will set a new record.

According to the data released by the National Bureau of Statistics of China in 2022, the sales and output of new energy vehicles in Shaanxi rank second in the country, and the growth rate of new energy vehicles in Shaanxi ranks first in the country [4] . In 2022, Shaanxi will produce 1.338 million vehicles and 1.02 million new energy vehicles. The production of new energy vehicles increased by 272%. The production of new energy vehicles is 175 percentage points higher than that of the whole of China, accounting for 76.2% of the production of automobiles in Shaanxi Province and 14.5% of the production of new energy vehicles in China [5]. Shaanxi's new energy vehicle production growth rate and scale lead the whole of China. The accumulative output growth rate of new energy vehicles in Shaanxi ranks first in China [6-8]. The production of new energy vehicles in Shaanxi ranks second in China. New energy vehicles are the main engine for the rapid growth of Shaanxi Automobile, with strong development potential [9]. However, Xi'an accounts for 99% of Shaanxi's new energy vehicle production. Therefore, it is necessary for this paper to conduct research on consumers' willingness to consume new energy vehicles in Xi'an, which will help find consumers' purchase needs and further increase the sales of new energy vehicles in Xi'an [10].

2. Theoretical backgrounds and hypothesis development
2.1. Concept model

This paper classifies the factors that affect consumers' willingness to purchase new energy vehicles into three categories: personal green consumption concept, new energy vehicle product image and promotion factors, and policy factors. This paper will build a theoretical model from these three dimensions.

As shown in Figure 1, after sorting out the influencing factors of the purchase intention of new energy vehicles in the previous article, this paper selects product and promotion factors, policy factors and personal green consumption concept as the influencing variables of this research to make the article easy to understand. In addition, according to existing research, product image and promotion are further divided into two dimensions: new energy vehicle technology and related supporting facilities, new energy vehicle promotion and publicity, and policies are divided into policy awareness and policy influence two dimensions.
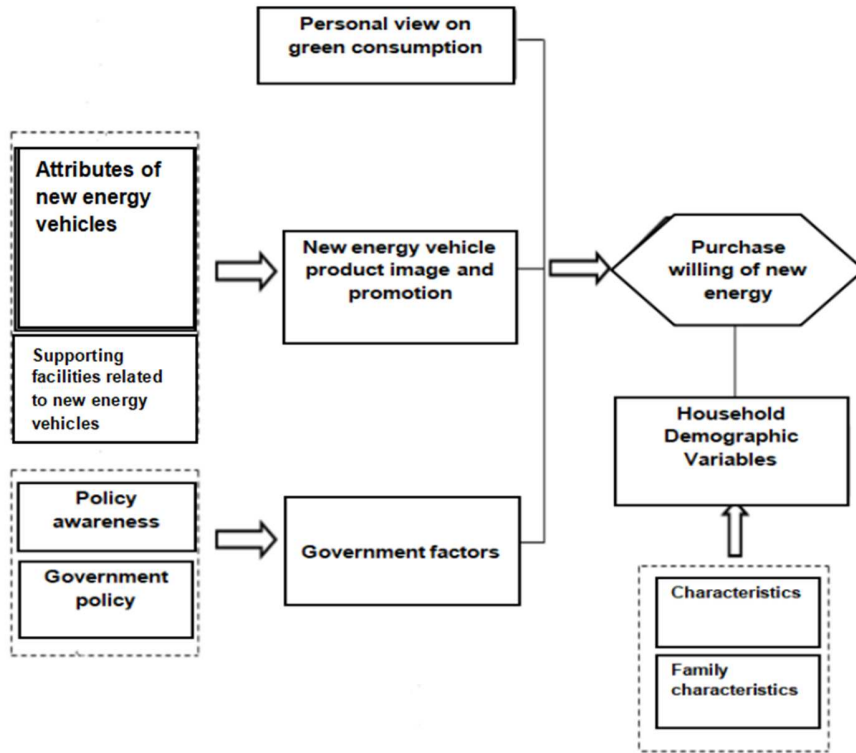
Figure 1: Theoretical model of consumers' willingness to purchase new energy vehicles

2.2. Research status

About Market Research, Cong (2020, 01) and others studied the protection and development of intangible cultural heritage crafts under innovative business models, and analyzed the status quo of intangible cultural heritage in Shaanxi Province through market research. About Customer About Buying Willingness. Ying (2022, 11) took Changchun City as an example to explore the influence and influencing factors of consumers' willingness to buy fresh agricultural products online. About New Energy Vehicle. Lijie (2022.07) took this new energy development issue as a starting point to conduct research on the actual situation of X City.

2.3. Proposal of research hypothesis

The influencing factors of new energy vehicle purchase intention include government policy factors, new energy vehicle product image factors, and personal green consumption factors. Therefore, the specific assumptions are as follows:

H1: Government policy factors (exogenous latent variables) have a significant impact on citizens' willingness to purchase new energy vehicles (endogenous latent variables). This variable reflects the indicators (observation variables) of government policy factors and indirectly affects citizens' willingness to purchase new energy vehicles through their influence on government policies.

H2: The image factor of new energy vehicle products (exogenous latent variable) has a significant impact on the willingness of citizens to buy new energy vehicles (endogenous latent variable). This variable reflects the indicators (observation variables) of new energy vehicle product image factors, and indirectly affects the public's willingness to purchase new energy vehicles through the impact on the new energy vehicle product image.

H3: Personal green consumption concept factors (exogenous latent variables) have a significant impact on citizens' willingness to buy new energy vehicles (endogenous latent variables). This variable reflects the various indicators (observation variables) of personal green consumption concept factors, which indirectly affect citizens' willingness to purchase new energy vehicles through their influence on government policies.

3. Methodology
3.1. Research design
This chapter uses questionnaire survey method and empirical research method to study this article. The researcher employed the use of quantitative descriptive correlational research design in order to examine the current conditions of the variables involved in the study as well as to successfully achieve the objectives set by the researchers in collecting the necessary data present in the environment. Specifically, the researchers chose to employ the quantitative descriptive correlational research design because it will help in the validation of current conditions that may be dominant in order to determine the relationship between Consumer purchase intention and influencing factors.

3.2. Questionnaire design and testing
Based on the above theoretical model, combined with the existing research of other scholars, the following questions are proposed, covering personal green consumption views, new energy vehicle product image factors, and government policy factors. The scale is shown in Table 1:

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Table 1: Measuring indicators of policies, new energy vehicles, and consumer factors

Variable		Measurem
Personal view on green consumption	Personal Green Consumption Concept	X1
		X2
		X3
		X4
Influencing factors of automobile brand image	Car's own attributes	X5
		X6
		X7
		X8
	Related supporting facilities	X9
		X10
		X11
		X12
Policy factors	Policy cognition	X13
		X14
	Policy awareness	X15
		X16

After compiling the scale of consumers' willingness to purchase new energy vehicles, a scale was compiled for consumers' willingness to purchase, as shown in the following table:

Table 2: Measuring indicators of purchase intention

Variable	Measurement
Purchase Willing	Y

In order to identify the above-mentioned scale problems, we distributed questionnaires to collect data in their respective districts, conducted a preliminary test on the predicted questionnaires, calculated the scores of the returned questionnaires according to the scoring rules, and used item analysis to test and identify the discriminative power of each question.

T**he LIKERT 5** metric in the second step above Shown below is the response scale the researchers used in gathering the data.

Table 3: 5point Likert Scale

Rating Scale	Range of Scores	Qualitative Equivalent	Interpretation
5	4.00 – 5.00	Strongly Agree	Satisfaction is always evident
4	3.00 –4.00	Few Agree	Satisfaction is seldom evident
3	2.00 –3.00	Agree	Satisfaction is oftentimes evident
2	1.00 –2.00	Few Disagree	Satisfaction is seldom evident
1	0.00 –1.00	Strongly Disagree	Satisfaction is not evident

4. Results

In order to ensure the validity and reliability of the questionnaire, this paper checks the reliability and validity of the data before the empirical analysis to ensure the next empirical analysis.

4.1. Reliability analysis

This paper uses the Cronbach'α coefficient method for reliability testing, which mainly reflects the relationship between the internal items of the test, and examines whether each item of the test measures the same content or characteristics. The Cronbach'α coefficient is directly proportional to the reliability of the questionnaire, and the higher the coefficient, the better. The test results are shown in Table 4 below:

Table 4: Reliability test results of each factor

Variable	Number of questions	Cronbach'α
The impact of personal green consumption concept	4	0.873
Product image impact	8	0.950
Policy impact	4	0.876

The value range of reliability is between 0-1. Generally speaking, if the reliability coefficient of the scale is lower than 0.6, the survey results of this scale are not credible; if it is above 0.7, it indicates that the reliability of the scale is good. A reliability coefficient above 0.8 indicates good reliability of the scale, and a coefficient above 0.9 indicates good reliability of the scale. The results obtained from this paper can be obtained: the Cronbach'α

coefficient obtained from the 4 items affected by the personal green consumption concept is 0.873, indicating that the reliability of the personal green consumption concept is good; The Cronbach'α coefficient is 0.950, indicating that the reliability of product image design is very good; the Cronbach'α coefficient of policy influence is 0.876, indicating that the reliability of policy influence is good. Therefore, judging from the 9 subscales in the table, the reliability coefficients of each variable are above 0.87, indicating that the data of each subscale can be trusted. It can be seen that the reliability values of each subscale have reached the standard of this study, and the questionnaire data has high reliability. The data obtained from the questionnaire can be used as the basis for descriptive statistics and inferential statistics in the following sections.

4.2. Validity analysis

This paper uses factor analysis to test the validity of the questionnaire, and at the same time screens the corresponding indicators. The test results are shown in the table below:

Table 5: KMO and Bartlett sphericity test table

Statistics	Coefficient
Kaiser-Meyer-Olkin metric of sampling adequacy.	0.988
Bartlett's Sphericity Test Approximate Chi-Square	9153.043
Df	153
Sig.	0.000

The KMO coefficient obtained in this paper is 0.988, indicating that the results of this study are very suitable for factor analysis. The KMO statistic is a value between 0 and 1. When the sum of squares of simple correlation coefficients among all variables is much greater than the sum of squares of partial correlation coefficients, the KMO value is close to 1. The closer the KMO value is to 1, the stronger the correlation between variables, and the more suitable the original variables are for factor analysis. When the sum of squares of the simple correlation coefficients among all variables is close to 0, the KMO value is close to 0. However, the closer the KMO value is to 0, the weaker the correlation between variables, and the less suitable the original variables are for factor analysis.

4.3. Inference statistics

The regression coefficients of the respondents' awareness of the restriction policy and subsidy policy are 0.437 and 0.295, respectively, indicating that compared with the subsidy

policy, the restriction policy has a stronger impact on the respondents' willingness to purchase new energy vehicles.

(1) Regression analysis of personal green consumption concept on purchase intention of new energy vehicles

Through the survey of residents in Xi'an area, it is found that the correlation between personal green consumption concept and new energy vehicle purchase intention is suitable for regression analysis. The specific regression relationship is as follows:

Table 6: Regression relationship between personal green consumption concept and willingness to purchase new energy vehicles

Project	Regression coefficients	t-value	P-value	VIF
Constant	0.22	2.04	0.042*	-
X1	0.22	5.46	0.000**	2.10
X2	0.24	6.16	0.000**	2.10
X3	0.21	5.16	0.000**	2.16
X4	0.25	6.42	0.000**	2.16
sample size	601			
R²	0.583			
Adjust R²	0.580			
F	F(4,595)=207.848,p=0.000			
* p<0.05 ** p<0.01				

From the four variables in the personal green consumption view in Table6 (I am an environmentalist and advocate green life; I think new energy vehicles can reduce environmental pollution; I think that buying new energy vehicles can save current natural resources; driving new energy vehicles Energy vehicles can better reflect personal social responsibility) The relationship between the purchase intention of new energy vehicles can be obtained: correlation coefficient R=0.763, and

$$Y1=0.22+0.22X1+0.24X2+0.21X3+0.25X4$$

(2) Regression analysis of new energy vehicle brand image on new energy vehicle purchase intention

New energy vehicle brand image - regression analysis of new energy vehicle attributes on new energy vehicle purchase intention. The regression relationship obtained by analyzing the data obtained through the survey of the brand image of new energy vehicles - the attributes of new energy vehicles themselves and the willingness to purchase new energy vehicles is shown in Table 7:

Table 7: Regression relationship between new energy vehicle brand image - new energy vehicle attributes and new energy vehicle purchase intention

Project	Regression coefficients	t-value	P-value	VIF
Constant	0.27	2.50	0.013*	-
X1	0.18	4.35	0.000**	2.29
X2	0.22	5.35	0.000**	2.24
X3	0.20	4.78	0.000**	2.38
X4	0.15	3.49	0.001**	2.56
sample size	601			
R²	0.581			
Adjust R²	0.578			
F	F(5,594)=164.814,p=0.000			
* p<0.05 ** p<0.01				

It can be obtained from Table 7: the four variables in the attributes of new energy vehicles in the brand image of new energy vehicles: the style and appearance of new energy vehicles have a great influence; the convenient operation of new energy vehicles has a great influence; The degree of influence of artificial intelligence is very large; the degree of influence of new energy vehicle power and new energy is very large, and the correlation coefficient with the purchase intention of new energy vehicles is: R=0.762, and the dependent variable purchase intention is affected by the attributes of new energy vehicles in the brand image of new energy vehicles The influence relationship of the four variables in is:

$$Y1=0.27+0.18X5+0.22X6+0.2X7+0.25X8$$

Regression analysis of new energy vehicle brand image-new energy vehicle supporting facilities on new energy vehicle purchase intention. Through the survey of new energy

vehicle brand image-new energy vehicle supporting facilities on new energy vehicle purchase willingness, the data is analyzed. The regression relationship that can be obtained from the analysis is shown in Table 8:

Table 8: Regression relationship between new energy vehicle brand image-new energy vehicle supporting facilities on vehicle purchase intention

Project	Regression coefficients	t-value	P-value	VIF
Constant	0.29	2.78	0.006**	-
X1	0.18	4.45	0.000**	2.63
X2	0.19	4.61	0.000**	2.32
X3	0.17	4.00	0.000**	2.55
X4	0.16	4.04	0.000**	2.29
sample size	601			
R²	0.598			
Adjust R²	0.594			
F	F(5,594)=176.453,p=0.000			
* p<0.05 ** p<0.01				

From the regression relationship between the supporting facilities of new energy vehicles in the brand image of new energy vehicles and the willingness to purchase cars in Table 8 above, we can get: the four variables in the supporting facilities of new energy vehicles in the brand image of new energy vehicles (influence degree of new energy vehicle maintenance very large; the replacement frequency of new energy vehicle parts has a great influence; the convenience of charging piles and charging stations for new energy vehicles has a great influence; the after-sales service system of new energy vehicles has a great influence) The correlation coefficient is: R=0.773, and the dependent variable purchase intention is affected by the regression relationship of the four variables in the new energy supporting facilities in the new energy vehicle brand image:

$$Y3=0.29+0.18X9+0.19X10+0.17X11+0.16X12$$

(3) Regression analysis of the impact of new energy-related policies on consumers'

willingness to purchase

The regression relationship obtained through the survey of the new energy vehicle policy on the purchase intention of new energy vehicles and the analysis of the data is shown in Table 9:

Table 9: Regression relationship between new energy policies and willingness to purchase new energy vehicles

Project	Regression coefficients	t-value	P-value	VIF
Constant	0.35	3.25	0.001**	-
X1	0.21	5.41	0.000**	2.11
X2	0.19	4.57	0.000**	2.23
X3	0.27	6.76	0.000**	2.19
X4	0.22	5.63	0.000**	2.16
sample size	601			
R²	0.572			
Adjust R²	0.569			
F	F(4,595)=198.528,p=0.000			
* p<0.05 ** p<0.01				

From Table 9, we can get the four variables set in the new energy vehicle policy (new energy vehicle subsidies are greater, car purchase discounts are greater; new energy vehicle taxes are low, vehicle purchase tax is exempt; new energy vehicles have preferential bank loan policies; The correlation coefficient between the positive impact of Xi'an's traffic restriction policy on new energy vehicle consumption and the willingness to purchase new energy vehicles) on the willingness to purchase new energy vehicles is R=0.754, and the dependent variable purchase willingness is affected by the four factors in the new energy vehicle implementation policy The regression relationship of each variable is:

$$Y4=0.35+0.21X13+0.19X14+0.27X15+0.22X16$$

5. Conclusions

On the basis of referring to and learning from existing research, this paper obtained research data through questionnaire surveys. After a series of empirical studies such as correlation analysis, regression analysis, independent sample T-test, and establishment of

structural equation models, the following research conclusions were finally drawn:

1. Strong influence of individual characteristics.From the regression analysis table of respondents' gender, age, annual family disposable income and purchase intention, it can be concluded that gender factors have no effect on consumers' purchase intention. The people aged 26-45 have a strong willingness to purchase new energy vehicles. Consumers in this age group not only have a certain economic strength, but also have a little understanding of new energy vehicles or have a strong acceptance. The demand for new energy vehicles is relatively large. In addition, people with higher incomes have a stronger willingness to purchase new energy vehicles. Combined with field research, we infer that due to the high cost of new energy vehicles, although there are financial and tax subsidies, the same cost-effective vehicles, fuel vehicles are relatively cheap , For cars with the same price, the performance of fuel vehicles is better. Therefore, with a certain budget, low-income groups are more likely to choose fuel vehicles to meet their transportation needs, while middle- and high-income groups have a relatively loose budget and will consider green, low-carbon, emission reduction and other psychological needs, which will affect the demand for new energy vehicles. Car selection.

2. There is a big difference between having a car or not.From the independent sample t-test of whether there is a car at home and the weighted average of purchase intention, it can be seen that people who have a car at home have a stronger willingness to buy new energy vehicles than those who do not have a car. Out of awareness of environmental protection and the consideration of more convenient travel, many people who are troubled by traffic restrictions will choose to consider buying new energy vehicles. According to the data, people with cars at home are more troubled by the traffic restriction policy. Based on environmental protection or road traffic congestion, most citizens will still choose to support the implementation of the traffic restriction policy, regardless of whether they have a car at home. 40.0% of people without cars at home are indifferent to the restriction policy and have no significant impact on their lives. Therefore, for this group of people, on the premise that they have no intention to buy a car in the near future, they are not interested in new energy vehicles. purchase intention is not strong.

3. Green concept to lead the way. Consumers' personal green consumption concept has a significant positive impact on purchase intention. It shows that the income level of consumers plays a decisive role in purchasing decisions, and they pay more attention to the impact of the products they purchase on the environment. Before consumers have an in-depth understanding of the product itself, people with a strong personal green view will more actively consider buying new energy vehicles.

4. The appearance of the car has little influence, and it is fundamental to pay attention to the interior, and the supporting facilities can keep up. The product image includes the internal image of the product (the attributes of the car itself) and the external image of the

product (the attributes of the car accessories). Among them, the internal image of the product has passed the significance test of regression analysis, which has a significant positive impact on the willingness to purchase new energy vehicles; while the external image of the product has not passed the significance test of regression analysis, and has no significant impact on the willingness to purchase new energy vehicles.

REFERENCES

1. Ye Youting, Research on the Incentives of Knowledge-based Employees in L Market Research Company, *Southwest University*, 87 (2022) 1-83.
2. Li Qiqi, and Yang Shuxia, Practice analysis of public welfare marketing based on market research, *Chinese Market*, 28 (2022) 8-18.
3. Ma Jiaying, Analysis on the construction path of the new industrial ecological chain of new energy vehicles, *Industrial Innovation Research*, 12 (2022) 28-30.
4. Li Jiajin, Collaborative innovation and development of new energy vehicle industry ecological chain, *Engineering Construction and Design*, 2 (2020) 131-132.
5. Han Jiqin, Policy subsidies, R&D investment and innovation performance-based on the perspective of new energy automobile industry, *Industrial Technology Economics*, 8 (2021) 40-46.
6. Li Yingyan and Huang Tiyun, Research on new energy vehicle industry policy, *Cooperative Economy and Technology*, 18 (2020) 17-19.
7. Jin Linhe, Analysis of china's new energy vehicle industry ecological chain development measures, *China-Arab Science and Technology Forum*, 5 (2020) 166-167.
8. Li Jiajin, Research on collaborative innovation and development of ecological chain of new energy automobile industry, *Engineering Construction and Design,* 2 (2020) 131-132.
9. Chang Jiying and Yang Yuqi, Research on the marketing model of BYD's new energy vehicles, *Modern Business,* 23 (2022) 6-8.
10. Deng Min, Innovative thinking of marketing model under the background of digitalization, *Modern Marketing*, 8 (2022) 155-157.