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**Reasons affecting the consumption of new energy vehicles in
Suzhou, China**

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Abstract

With the problem of environmental pollution and energy shortage becoming more and more serious, countries all over the world are innovating technologies. The energy consumption and carbon emissions generated by transportation are the main factors causing the global greenhouse effect (Jiang, 2015). Research shows that, in China, vehicle exhaust is the main source of CO and NOX in air pollutants in many cities (Wang, 2014). To alleviate many pollutions caused by transportation, new energy vehicles have increasingly become the strategic goal of many countries, as well as China. As a country with a large population and consumption, China has a great responsibility for environmental protection, and understanding Chinese consumers' purchasing psychology and behavioral habits is of great guiding significance for the development of China's new energy vehicles.

This paper attempts to find the influencing factors that lead consumers to purchase new energy vehicles. Based on the theory of planned behavior (TPB) framework of consumer behavior (Ajzen, 1991a), it will construct a new energy vehicle consumption behavior model in a specific city in Suzhou in the context of China. Taking attitudes, social norms, perceived behavioral control, behavioral purchase intentions, and new energy vehicle product characteristics that are customer perceived value theory with the references of researches from scholars to summarize durable goods into four dimensions: quality value, function value, price value, and service value, together with government policies as nine variables, the hypothesis is that the theory of planned behavior has an influence on consumers' willingness to purchase new energy vehicles; Government policies and the perceived value play a mediating role between TPB and purchase intention.

The influencing factors of new energy vehicle purchase intentions were explored, the questionnaire method was used to collect data, and statistical analysis software was used to analyze the purchase intentions of new energy vehicles. Then the model will be tested, together with descriptive statistics, reliability, and validity test of the survey.

Finally, the correlation analysis and regression analysis are carried out on the questionnaire data, and the research hypothesis is summarized, then based on the empirical conclusions, it proposes measures to guide consumers consumption intentions of new energy vehicles. It is hoped that based on the data of the paper, will

help enterprises to discover the real needs and potential consumption intentions of consumers, and at the same time, both enterprises and the government can adjust sales strategies and policies according to the research results, thereby helping the long-term development of new energy vehicles.

Keywords: *New Energy Vehicles, TPB (Theory of planned behavior), Purchase Intentions, Perceived Value, Government policies, Suzhou*

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Introduction

1) Research background

Environmental issues have always been the focus of worldwide attention. At present, environmental pollution problems have occurred to varying degrees around the world, and the aspects with global impact include atmospheric environmental pollution, marine pollution, and urban environmental problems. Globalization has brought economy and trade, but environmental pollution is also increasingly internationalized. For example, the warmer and humid climate in recent years has caused changes in the spread of infectious diseases; the melting of Arctic glaciers; the rise in sea levels has affected the global range of air; etc.

In recent years, due to the rapid economic development, fog and dusty weather have frequently appeared in many large cities in China, and the environmental quality of China is worrying. The topic of environmental protection is the focus of public attention, and how to improve air quality has become a problem that both government and society need to face together. Facing the deteriorating weather and environmental problems such as global warming, the development of green, environmentally friendly, and energy-saving new energy vehicles is one of the necessary conditions for improving the climate, and this movement has also received attention and response from the whole society. The world's major auto companies are committed to the development of energy-saving and environmentally friendly vehicles. In the current market, compared with traditional vehicles, new energy vehicles have gained widespread attention in the Chinese market. Relevant research data shows that China's auto industry achieves energy conservation and emission reduction through the following several methods: one is to improve vehicle technology, the other is to popularize small-displacement vehicles, it is also a way to use diesel-driven vehicles, and the last is to develop new energy vehicles.

According to the "Administrative Rules for the Access of New Energy Vehicle Manufacturers and Products", China's new energy vehicles include hybrid electric vehicles (HEV, PHEV), fuel cell vehicles (FCEV), pure electric vehicles (EV, including solar vehicles), Hydrogen vehicles, gas vehicles, and other new energy vehicles. During the 2008 Beijing Olympic Games, the independent innovation of new energy vehicles researched and developed by the national "863" plan were displayed and used

intensively. 10 billion yuan to support the industrialization of new energy vehicles and key components. Since 2010, China has provided financial subsidies to new energy vehicles. After years of development, the cultivation of new energy vehicle consumption habits has been fruitful, and the charging environment for new energy vehicles has been improving. Sales of new energy vehicles have been rising steadily, especially in big cities. In 2021, China's new energy vehicle industry developed rapidly, with sales of 3.521 million vehicles, ranking first in the world for seven consecutive years, with a market share of 13.4%. The executive vice president and secretary-general of the China Association of Automobile Manufacturers described the development trend of new energy vehicles in 2021 as "like winter wheat meets spring rain" (Liu, 2022).

2) Research significance

As a country with a large population, China has limited energy resources and is in short supply. Because China's environment has deteriorated in recent years, and the economy must continue to develop, the development of new energy vehicles has become the primary reason for the transformation of the automobile industry. After the development of the past 10 years, major wholly owned brands, joint venture brands, and state-owned brands have launched their hybrid models, fuel cell models, and pure electric models, and have achieved mass production.

On the other hand, the automobile industry is an important pillar industry of the national economy and a symbolic industry that reflects the national competitiveness. As the world's major automobile production and sales country, China's automobile production and sales will maintain a rapid growth momentum for a long period of time in the future, and the resulting contradiction between energy supply and demand and environmental pollution will become more prominent. Vigorously developing energy-saving and new energy vehicles and accelerating the industrialization process of energy-saving and new energy vehicles can effectively solve energy contradictions and improve the environment, help realize the transformation and upgrading of China's automobile industry structure and promote the sustainable development of China's economy.

Due to the knowledge stage and the existence of many other factors, the sales of new energy vehicles have not reached an ideal level. This is the biggest problem facing China's development of new energy vehicles, and it is also where major auto companies are deeply concerned (Yue and Men, 2018). Although government departments, auto companies, and mainstream media have promoted various policies for new energy

vehicles, such as preferential policies, most of the research tends to descriptive analysis of obstacles encountered in the promotion of new energy vehicles in China and the analysis of government subsidies and preferential policies for manufacturers. The analysis of consumers' new energy vehicle consumption psychology needs, and consumer behavior has relatively limited amount of empirical research. As most scholars agreed, it is necessary to quantitatively analyze consumers' purchase intention of new energy vehicles and the factors that affect consumers' purchase of new energy vehicles (Lin, 2018), by starting from consumer behavior, marketers could comprehensively understand the reasons why new energy vehicles are vigorously promoted but the sales volume is not high, thus, to increase the sales volume of new energy vehicles.

3) Research content and framework

Chapter 1, Introduction. This chapter emphatically explains the research background, significance, concept, and content of the scientific subject of this paper.

Chapter 2, the history of new energy, the origin and types of new energy vehicles, and the development status in China.

The third chapter is literature review. Summarizing relevant analysis and research principles around the world lays a solid basic principle for the author's analysis and research in this article.

Chapter 4, Model Construction and Research Hypotheses. This paper mainly hopes to further clarify the research variables by means of correlation analysis and build corresponding models on this basis to verify the proposed hypothesis.

The fifth chapter is the questionnaire design and variable selections of the thesis.

The sixth chapter is empirical analysis, collecting questionnaire data to carry out correlation analysis and control variable, etc., which confirms the hypothesis put forward in this paper.

The seventh chapter is the conclusion and prospect.

4) Research methods

i. Literature research method

After carefully reading many domestic and foreign literature related to new energy vehicles, I have made systematic research on the concept of new energy vehicles and other related theories, theory of planned behavior, customer perceived value,

government-related policies, and market and other related theories. The combining has laid a solid theoretical basis for the research of this paper.

ii. Questionnaire survey method

This paper mainly adopts the form of a questionnaire survey, it collects, and organizes a large amount of relevant data, and combines the previous research and the research needs of this paper to optimize the content of the questionnaire required by this paper.

Chapter 1 The history and types of new energy vehicles

1.1 The history of automobile development

1.1.1 The birth of electric vehicles worldwide

As early as the 19th century, electric vehicles have appeared, the invention of the electric motor is earlier than the internal combustion engine. As early as 1873, the Englishman Han Bidson first completed the use of an electric combined engine device as the power of the vehicle (Liu, 1994b). In 1900, of the 4,200 cars sold in Europe and the United States, 40% were steam locomotives, 38% were electric cars, and the remaining 22% were gasoline cars. At that time, fuel vehicles were still using external combustion engine technology, which was noisy and emitting black smoke. It was not the first choice for European upper-class consumers, so the development of electric vehicles was promoted, and pure electric vehicles were used in the late 19th century. Development peaked by 1920 (Chen and Wu, 2008). Therefore, Europe is not only the birthplace of traditional cars, but also the birthplace of electric vehicles.

1.1.2 The early 20th century

The history of China's automobile development is relatively slow, and it is driven by foreign capital. At the beginning of the 20th century, as early as the 1950s, China began to try to independently develop electric vehicles; it was triggered by a move by Zhang Xueliang. Zhang advocated buying a "Rui Xue" from the United States and then disassembled the car. Except for the original car parts such as the rear axle of the engine, electrical devices, and tires, other parts were redesigned and manufactured. It took two years to May 1931., and finally successfully trial-produced China's first car, but this is just an oil-burning car, and electric vehicles have not yet been develop (Bai, 2021).

After a set of plans were published and years of exploration and experiments, in 1998, it completed the formulation of the "Electric Vehicle Standardization System" as planned. In 2000, the Ministry of Science and Technology further listed the industrialization of electric vehicles as a major scientific and technological project, laying the foundation for the development of the electric vehicle industry. Since 2001, electric vehicles have been specially established, with fuel cell vehicles, hybrid electric vehicles, and pure electric

vehicles as the main product types, and multi-energy powertrain control, drive motors, and power batteries as the main engines of electric vehicles, and comprehensively build a technology platform for the independent development of electric vehicles in China. In 2001, China invested more than 1 billion yuan in the development of electric vehicles and new fuel cells (Chen and Wu, 2008). With the development of engine technology, the invention of internal combustion engines, and the improvement of production technology, fuel vehicles have formed an absolute advantage at this stage. The main advantage is that although the internal combustion engine is relatively large and emits exhaust gas, it will pollute the environment and make a lot of noise, but its fuel is easy to carry, and when used in transportation, it can carry enough fuel for a long distance (Xiao, 2017). The electric motor is small, does not pollute the environment, does not emit exhaust gas, and has very little noise, but it needs electric energy to work, and electric energy is not easy to carry unless it is to carry a battery, and the capacity of the battery is limited, so the driving distance is limited. If it is used on fixed occasions, a motor can be used, which is relatively suitable. However, it is surprising that pure electric vehicles, the power plant with the battery motor group as the main model, have not withdrawn from the stage of the automobile field since the moment of birth, the trams running on the streets of the big cities, or the light rail trains electric motor units are used (Liu, 1994a).

1.1.3 The impact of the oil crisis on the automobile market

At this stage, the European continent has entered the middle stage of industrialization. During this period, oil crises have been frequently highlighted and become a problem that cannot be ignored by human beings. People have realized this problem and began to reflect on the huge disasters that the increasingly serious environment will bring to human beings, and the electric motor is small, does not pollute the environment, does not emit exhaust gas, and has very little noise, which makes people re-examine pure electric vehicles (Midler and Beaume, 2010). Entering 20 century, the great development of the world's auto industry is inseparable from the support of the petroleum industry. Automobiles grow and develop based on petroleum, and automobile oil is an important driving force for oil demand. Excluding the energy consumed in automobile production, according to Luo, by 2005, the world's oil more than a third of production goes to cars (Luo and Du, 2005).

The two oil crises made people realize that the development and production of diesel and alcohol fuels that can improve fuel economy and reduce fuel costs can alleviate the serious consequences of the oil crisis, and the oil crisis has also led to the use of alternative powertrain cars such as hydrogen fuel vehicles and electric vehicles (Ji, 2020).

Driven by capital, in the past ten years, the drive technology of electric vehicles has developed greatly, pure electric vehicles have received more and more attention, and small electric vehicles have begun to occupy a fixed market, such as golf course scooters, as well as the light rail, the cable car in the center of the city.

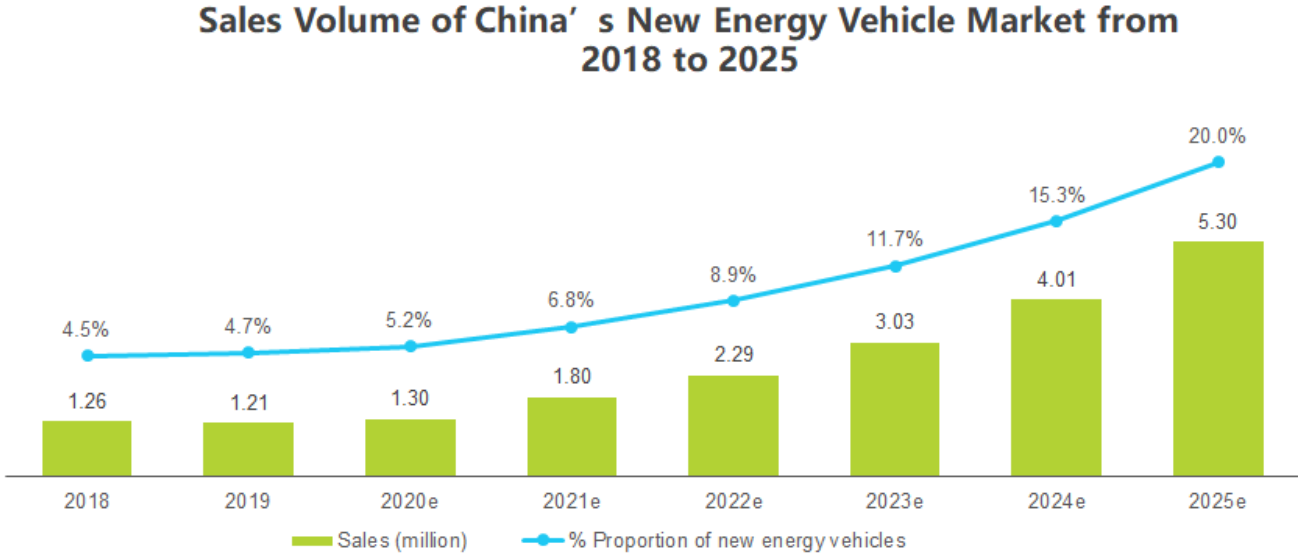
1.1.4 The backwardness of battery technology

Back to early stage, the biggest problem that hindered the development of electric vehicles in the 1990s was the lag in the development of battery technology. There was no breakthrough in the battery life, resulting in no breakthrough in the battery life of the charging box, posing a huge challenge for electric vehicle manufacturers. Under pressure from the market, traditional automakers have begun to develop hybrid vehicles to overcome short battery and range problems. This time, PHEV plug-in hybrid and HEV hybrid are the main types of NEVs (Wang and Luo, 2019). Meanwhile the development of electric vehicles has become a global issue, for all parts of the world, the factors hindering the development of electric vehicles are mainly concentrated in national policies, regulations, infrastructure, funds and other aspects (Chen and Wu, 2008).

1.2 Current situation of NEVs consumption in China

Combined with the significance of the development of new energy for China, here I once again analyze the development status of China's new energy vehicles. China's new energy vehicle industry is still in the early stage of development and has huge potential. The General Office of the State Council issued the "New Energy Vehicle Industry Development Plan" on November 2, 2020, proposing the development goal that the sales of new energy vehicles will account for about 20% of the total sales of new vehicles by 2025 (iRESEARCH GLOBAL, 2021). It is expected that new policies will be introduced continuously to promote the rapid development of the new energy vehicle industry. If

the development of the industry can be combined with charging infrastructure construction, capital investment, and national and local policies, China's new energy vehicle sales may reach 5.3 million in 2025 (Hu and Liang, 2021).



Source: Interviews with experts, China Association of Automobile Manufacturers, Ministry of Industry and Information Technology. The calculation is based on iResearch statistical model.
 Note: The historical data and forecast data listed in the report are all rounded (special case: Accurate to one decimal place when the difference is less than 1), rounding is included; The calculation of the growth rate is based on accurate values.

Figure 1 Sales volume of China's New Energy Vehicle Market from 2018 to 2025 (iRESEARCH GLOBAL, 2021)

The latest data shows that in October 2021, the production and sales of new energy vehicles increased by 1.3 times year-on-year, of which policy support was the main reason for the continued growth of new energy vehicle sales. And with the general construction of charging facilities, the new energy vehicle market is ushering in a new round of growth. Among them, the production and sales of pure electric vehicles, plug-in hybrid vehicles and other sub-models also hit a record high (Wen, 2022). According to data from the China Association of Automobile Manufacturers, private car purchases have become the mainstay of China's new energy vehicle consumption (iRESEARCH GLOBAL, 2021).

1.3 Current Situation of NEV consumption in Suzhou

Jiangsu Province is one of the most developed provinces in China. Suzhou City is very close to Shanghai, the world economic center. It not only has an advantageous geographical location but also has a government investment of 2.03 billion yuan. There

are many units, enterprises, and key R&D enterprises undertaking advanced technology projects, with sales of nearly 10 billion yuan, and has completed the full coverage of the completely new energy vehicle industry system such as passenger cars, public buses, special cars, battery technology, and some key technologies that have even reached the national advanced level. Due to the support of the government, related industries and supporting industries have also developed relatively well. Not only that, but Suzhou's power battery technology level is also leading domestically. In the new energy vehicle branch field of power batteries, Suzhou City has strong technological leadership. Its representative enterprise, Cathay Pacific Huarong, uses battery electrolytes. The output is the third highest in the world. Phylon, a power battery manufacturer located in Suzhou, also leads the market share in its industry. As one of the world's largest manufacturers of lithium battery electrolyte additives, Huasheng's high-rate lithium-ion batteries have a market share of 1/3 of the world. Galaxy Lithium is one of the largest automated lithium carbonate battery companies in the world. These representative enterprises in Suzhou are enough to show that Suzhou is already at the domestic advanced level in this field, and its position in these technical fields will also enable the region where Suzhou is located to maintain an advantage in the competition in the new energy field in the larger market across the country status. In addition, Suzhou is a newly developed city with many colleges and universities, providing many talents, and the economy has a leading position in the country. Suzhou's GDP ranks among the top three in China, and it is rich in natural resources. Wind, solar, biomass resources, etc. Therefore, considering all the conditions, it is determined that Suzhou has super high technical and competitive advantages in this field. At present, the new energy vehicle industry has become a highlight and advantage of Suzhou's automobile development. To support the large-scale development of Suzhou's new energy vehicle industry, optimize Suzhou's industrial synergy, and extend the industrial development chain, Suzhou has increased policy and economic support for innovation carriers, and the Suzhou Municipal Government has vigorously promoted new energy. With the use of automobiles, a series of preferential measures and applicable projects have been introduced one after another. These factors have promoted the steady development of the new energy industry in Suzhou.

1.4 Definition of NEVs

New energy is different from traditional energy such as oil, coal and natural gas, and other traditional fossil energy. New energy mainly includes solar energy, electric energy, and wind energy (Zou, Zhao and Zhang, 2016).

Boulding, an American economist, put forward the concept of domestication economy in 1966: the economic development form based on resource recycling and recovery is the core of the circular economy. The main advantages of this economic form are high efficiency and low emissions (Murry and Haynes, 2015). New Energy vehicles are proposed in this economic development form, and Japan is the first country to propose new energy vehicles.

New energy vehicles generally refer to vehicles that use unconventional vehicle fuels as a power source, or use conventional vehicle fuels, adopt new vehicle power units, and integrate advanced technologies in-vehicle power control and driving. Cars with new technologies, new structures.

New energy vehicles include Electric Vehicles (EV), Hybrid Electric Vehicles (HEV), Fuel-Cell Electric Vehicles (FCEV)(Miao, 2017), as the figure 2 below:



Figure 2 Types of NEVs (Ai and Yang, 2011)

1.4.1 Types and functions

1) FCEV (Fuel Cell Vehicle) fuel cell electric vehicle

Fuel Cell Vehicle is a new energy vehicle that is between pure electric vehicles and fuel vehicles. Fuel cell vehicles are the trend of long-term electric vehicle development (Luo, Ma and Cai, 2014). It has the engine, transmission, transmission system, oil circuit, and fuel tank of traditional vehicles. There are also batteries, motors, and control circuits for pure electric vehicles, and the battery capacity is relatively large and has a charging interface; it combines the advantages of pure electric vehicles EV and hybrid vehicles HEV, which can realize pure electric, zero-emission driving, and can also pass Hybrid mode increases the driving range of the vehicle (Li, 2017). In the process of daily use, it can be used as a pure electric vehicle. Fuel cell vehicles fuel replenishment time can be completed within 3 minutes, and it has a longer driving range of about 600km, which is 3 to 5 times that of ordinary lithium battery vehicles, it can achieve zero emissions and zero fuel consumption (Wang, 2020). Due to the high cost of batteries, it is difficult for such vehicles to enter the household at a lower price in the short term. However, affected by the development trend of automobiles in China, and the government has been providing corresponding subsidies, plug-in hybrid vehicles may have become households and the car of choice (Sun and Xu, 2018).

2) HEV (Hybrid Electric Vehicle) Plug-in Hybrid Vehicle

HEV is a compromise between a traditional car and a fully electric vehicle: Plug-in hybrid vehicles can be charged solely by external devices and can completely replace fuel work. It only needs to be set to work in an all-electric state, and gasoline is used after the battery is exhausted, so the cost of use is significantly reduced. The advantages of plug-in hybrid vehicles are that the price is relatively low, the driving range is comparable to that of fuel vehicles, and they do not have to rely on charging facilities, so they are more practical. What's more, it reduces the demand for fossil fuels and improves fuel economy (fuel economy), to achieve the effect of energy-saving, emission reduction, and mitigation of the greenhouse effect. His disadvantage is that plug-in hybrid vehicles need to consider both pure electric and traditional fuel drives, so they are not zero-emissions (Luo, Ma and Cai, 2014).

3) EV (Electric Vehicle) pure electric vehicle

Electric vehicles are driven purely by electric motors. Pure electric vehicles are the development direction of electric vehicles in the future. At present, the cruising range has reached 500+km, but the cruising range will be reduced in the process of use in winter, because the battery of pure electric vehicles is afraid of cold and heat, so after EV cells are formed into battery modules, corresponding battery management control is required. What's more, pure electric vehicles face many problems, such as battery energy density, battery materials, vehicle life cycle analysis, charging technology, battery replacement mode, battery management system, safety and so on. The mainstream used in the market are ternary material lithium batteries and lithium iron phosphate batteries, which have problems of low energy density and short driving range; while ternary material lithium batteries have poor safety at high temperatures and are more likely to catch fire or even explode during use. At present, the battery management technology is not mature enough, and the development of pure electric vehicles is not smooth (Wang and Luo, 2019). Problems facing the development of pure electric vehicles. Automotive Digest, 8.). In addition, the battery life of pure electric vehicles is limited, and the replacement cost of the battery is relatively expensive, which may account for 50% or more of the cost. Although the current market policies and policies for the purchase of electric vehicles are relatively complete, the battery cost is not covered (Hang, 2019). For some car owners, there will be mileage anxiety (Luo, Ma and Cai, 2014).

1.5 The significance of developing NEVs

1.5.1 NEVs to the world

As the focus of the current and future development of the global automobile industry, new energy vehicles will have a greater impact on energy, environment, economy, technology, and society in various countries. The development of new energy vehicles is the only way for the country to achieve sustainable development, and it is a strategic measure to deal with climate change and promote green development (Chen, 2020). With the acceleration of a new round of scientific and technological revolution and industrial transformation in the world, the trend of "electricity and intelligence" of automobiles has become more and more obvious.

We mentioned earlier that although electric vehicles are more expensive to replace batteries, but according to relevant research, the cost of using new energy vehicles is very low: It only takes one-fifth of the cost of using new energy vehicles to run the same number of kilometers as the original, because the cost of electricity is only 20% of the cost of oil. In addition, the four-wheel-drive principle of electric vehicles is simple, the maintenance is convenient, and the after-sales maintenance of new energy vehicles does not require a lot of money (Wang, Wang and Sun, 2017). According to a survey from Bloomberg Intelligence, the development of new energy vehicles can greatly save oil consumption, once the consumption of electric cars increases, as shown in the figure below.

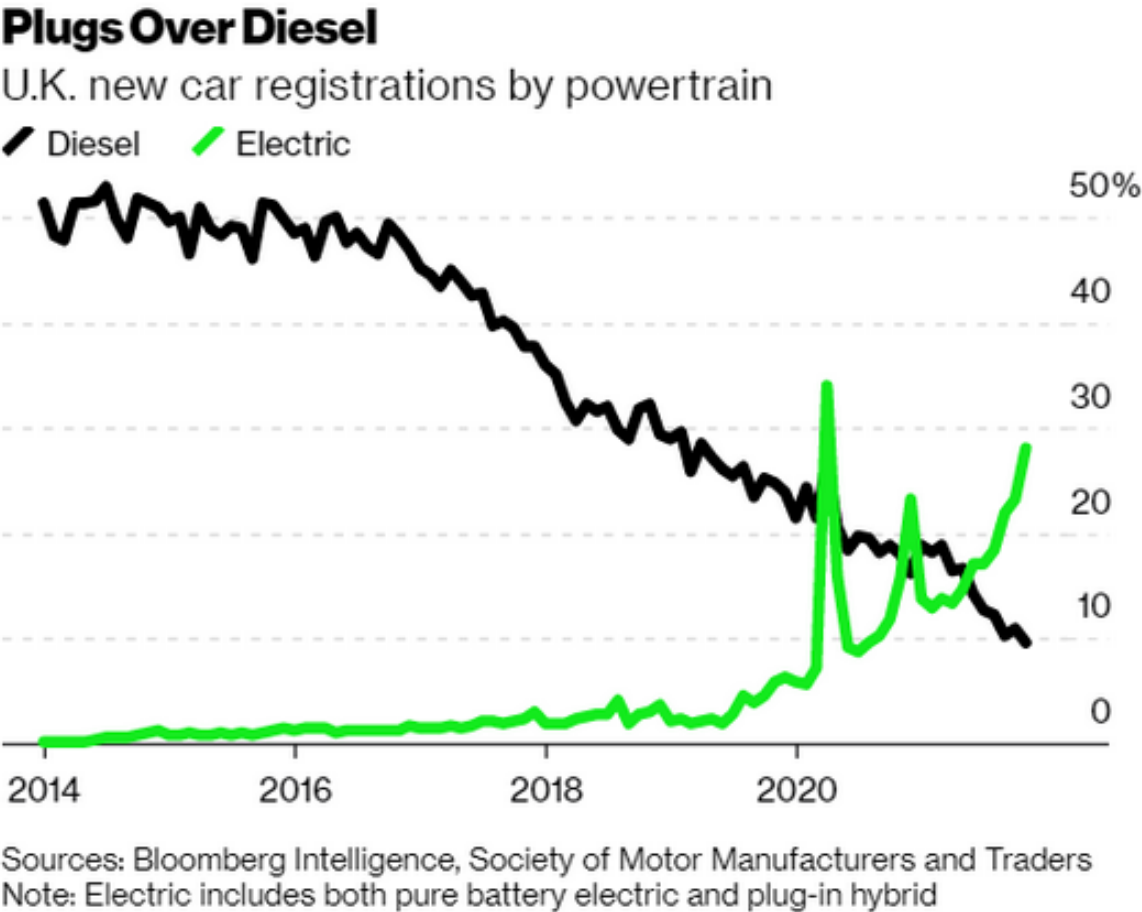


Figure 3 Plugs over Diesel (Bullard, 2021)

New energy vehicles avoid the combustion of a large amount of gasoline and diesel and use lithium batteries, which have excellent environmental performance. Compared with

traditional vehicles, the energy conversion efficiency of electric vehicles is as high as 90% (the energy conversion efficiency of traditional vehicles is 17%) (Guo *et al.*, 2014). At present, countries around the world are highly concerned about greenhouse gas emissions, and climate change is a major issue facing every country. The development of new energy vehicles is of great significance to the global solution of energy and environmental problems.

1.5.2 NEVs to China

Since 2014, the new energy transportation industry that replaces fossil fuels with electricity and fuel cells has flourished, and the transportation industry has been undergoing a green transformation. According to a report by Deloitte (Walton, Hamilton and Alberts, 2020), EVs is growing significantly and by 2030, will bring many changes and opportunities worldwide. Railway electrification and intelligent upgrading of transportation systems are gradually becoming global trends.

While advancing climate action, countries around the world attach great importance to the application of digital technologies to support the zero-carbon transition of sectors such as energy, industry, transportation, and buildings. According to the analysis of the World Economic Forum, by 2030, digital technologies such as 5G, the Internet of Things, artificial intelligence, cloud, etc. can contribute to 15% of the global carbon emission reduction.

In recent years, China has been seeking a more sustainable, inclusive, and resilient mode of economic growth. In September 2020, China pledged to the world to increase its nationally determined contribution to combating climate change and to adopt stronger policies and measures. Officially announced the dual-carbon climate goal of "strive to peak carbon dioxide emissions by 2030 and strive to achieve carbon neutrality by 2060". Over the past four decades, China's rapid economic development has been accompanied by high-intensity consumption of resources, massive consumption of fossil energy, and rapid growth of pollutants and carbon emissions. Since 2010, China has issued several policies to address climate change through industrial transformation and upgrading, energy structure adjustment, technological innovation, and other measures. At the end of 2019, China's carbon emission intensity dropped by 48% compared with 2005 ahead of schedule to achieve the carbon emission intensity reduction target of 40%-45% proposed in 2015. China's total carbon emissions are large and still on the

rise. In 2020, China's greenhouse gas emissions exceeded 10 billion tons, accounting for about a quarter of the world's total (Environment, 2020), the world's largest total emissions. Among them, the proportion of energy and industrial emissions is high, and it is a severe challenge to achieve the dual-carbon goal on the premise of ensuring the steady development of the economy. Under the premise of supporting policies, finance, and technology, China has carried out carbon neutrality actions from various aspects, among which the transformation and optimization of the energy system is a key factor in achieving carbon neutrality. More than half of the world's greenhouse gas emissions come from the energy industry. Therefore, the energy industry is the most important emission reduction area for all countries, and the task of emission reduction is arduous. According to the "2020 Energy Technology Outlook" report released by the International Energy Agency, global carbon dioxide emissions should achieve net-zero emissions around the middle of this century to achieve sustainable global economic and climate development, and global energy production and consumption patterns need to undergo major changes.

The energy transition mainly includes two aspects. The first is to realize the adjustment of energy structure, transform from fossil energy to renewable energy, comprehensively transform or adjust energy production, transmission, conversion, and storage, form a new energy system, and comprehensively improve the utilization rate of renewable energy; the second is to increase electric energy Substitute and electrify transformation efforts, promote multi-energy synergy and comprehensive cascade utilization of energy in the field of end-use energy, promote energy conservation and emission reduction in various industries, and improve energy efficiency. Our daily life is inseparable from the automobile as a means of transportation. The energy transition is closely related to the development of new energy vehicles. On the other hand, the development of new energy vehicles is in line with the adjustment and optimization of the energy structure.

As a developing country, since entering the 21st century, China's automobile production and sales have continued to grow, becoming the world's largest automobile country. In this context, the internal growth drivers, consumption structure, production mode, and competition pattern of the automobile industry have all undergone profound changes, and the constraints of external factors such as energy, environment, and transportation have become increasingly severe (Zhang, 2019).

The development of new energy vehicles is of great strategic significance for promoting the transformation and upgrading of the automobile industry, enhancing the international competitiveness of the industry, and building an environment-friendly society (Wu *et al.*, 2018).

- i. Conducive to reducing dependence on oil imports and safeguarding national energy China's automobile refined oil consumption accounts for nearly half of the total oil consumption. If all Chinese automobiles adopt traditional technologies in the future, the consumption of automobile refined oil will lead to about 75% of oil imports in 2050. This is a huge challenge to China's national oil security. But if China's new energy vehicles can account for about 60% of the total car consumption in 2050, this will greatly reduce China's dependence on foreign oil (Jiang *et al.*, 2010).

- ii. Conducive to alleviating the pressure of greenhouse gas emission reduction and controlling the emission of air pollutants. If the development of new energy vehicles can reach the target of about 60% of the car ownership by 2050, the greenhouse gas will be reduced by 30%, compared to all traditional vehicle technologies. Therefore, the development of new energy vehicles is conducive to effectively alleviating the pressure of greenhouse gas emission reduction (Ou, Qin and Chang, 2009). In addition, the promotion of new energy vehicles will also greatly reduce the emission of air pollutants during the operation of vehicles, thereby improving urban air quality and improving population health (Feng and Xu, 2016). What's more, the development of electric vehicles from another relatively small perspective, the current increase in vehicles has resulted in very serious noise pollution in major urban environments. According to authoritative research, the noise functional zones in large Chinese cities such as Shanghai and Beijing are seriously exceeding the standard at night, with a compliance rate of 89.9% during the day and 44.5% at night. The problem of noise in big cities has seriously affected the living environment of urban residents. Since electric vehicles come from electric energy, their noise pollution is much lower than that of traditional vehicles. Therefore, electric vehicles have a very positive significance in reducing noise pollution (Sun, 2018).

- iii. Conducive to the transformation and upgrading of China's automobile industry and even the manufacturing industry and help to promote technological innovation in electric vehicle-related fields (Chen *et al.*, 2018). As a typical product with a high degree of integration between the two themes of low carbonization and intelligence in the future, new energy vehicles involve several major fields such as material science, information technology, control technology, manufacturing technology, and manufacturing equipment. Industrial development will vigorously promote technological progress and technological innovation in relevant frontier basic research, design and development, testing and manufacturing in various fields, and relevant technology and product innovation will play an important role in technological innovation and lead to other industries (Liu, 2015).

1.6 Research Status of the New Energy Vehicle Industry

The driving force of new energy vehicle consumption refers to the factors that prompt various potential consumers to buy new energy vehicles in the new energy vehicle consumption market.

At present, in the literature that analyzes the factors affecting the purchase intentions of new energy vehicles, scholars have analyzed from many dimensions, such as customer perceived value, green cognition, government policies, product characteristics, and so on. This thesis focusses mainly on the product characteristics, government policies, and consumer psychology factors.

1.6.1 Product characteristics

The characteristics of new energy vehicles are closely related to the sales of new energy vehicles. With the development of new energy vehicles, the new energy vehicles have been improved more and more. Scholars have done a lot of empirical rresearches on the characteristics of new energy vehicles.

The product characteristics of new energy vehicles are closely related to technology. In the empirical research of new energy, many scholars have begun to study related technical issues such as the drive of electric vehicles.

Scholars such as Ma studied and analyzed the patents related to electric vehicles from 1970 to 2016 and found that solving the problem of how to charge the battery safely and quickly through the charging facility and distribute the energy to the various storage units is the field of electric vehicle technology. Topics of interest involve battery technology, charging facility technology, and power technology (Ma, Xu and Fan, 2022). As an attribute of new energy vehicles, functional technical issues have always been one of the important factors affecting consumers' purchasing decisions. Münde et al. believe that the technical specifications of electric vehicles will revolutionize the way the cars of the future will sound. Using 65 participants to present Ambisonic 3D stimuli from 11 different electric vehicles in four different driving scenarios using a sophisticated acoustic simulator, they revealed that auditory modality is an integral part of assessing product quality and is critical for enhancing user experience associated with aesthetic appreciation (Münder and Carbon, 2022).

Lin et al. investigated factors that may influence the public's willingness to buy electric vehicles through a survey in Chinese cities. A wider range, except for government subsidies, product characteristic factors such as price acceptability, vehicle performance, environmental concerns, etc. have a significant impact on respondents' willingness to purchase EVs (Lin and Wu, 2018). Another research by Wang et al. shows that car interior, comfort, handling, appearance and cost performance are the car performance that consumers care about (Wang, Su and Yan, 2017). Meanwhile Lu believes that when consumers buy new energy vehicles, the most important thing is the performance of the vehicle itself (Lu, 2017). Also scholars such as Kim concluded that the price value of electric vehicles is the strongest factor affecting the perceived value of electric vehicles (Kim *et al.*, 2018), which means that the perceived quality value of the car is the most worrying factor for consumers. Li Chuang et al. (Li, Ye and Wang, 2021) and Zhang Qiuxia et al. (Zhang and Liu, 2017) have made a conclusion that potential consumers are more concerned about the value, such as immature technology, not perfect follow-up services of new energy. Ding Rongjun et al. discussed new the key technologies and development trends of the motor drive system of energy vehicles and pointed out the key problems that China is currently facing in the development of drive motors (Ding and Liu, 2019).

In addition, based on the research and conclusions of the above scholars, many experts have also seen consumers' concerns about the charging problem. In order to solve the

charging problem, Yang believes that an advanced charging technology for distributed mobile energy over the Internet can be formed, and close cooperation with many market participants, that is, new energy vehicle companies, dealers, governments, banks, shopping malls, and car owners can consider establishing a new energy vehicle free charging alliance. Providing this service can form a cooperative model of co-construction and achieve effective and multilateral cross-border cooperation. Industry alliance win-win state (Yang *et al.*, 2018). In western countries, A scholar Featherman and his colleagues have concluded through quantitative analysis that when consumers think about purchasing new energy vehicles, they will take hedonic driving experience (interior, acceleration, luxury, speed, entertainment system, comfort, and autonomous driving) as a decision-making criterion (Featherman *et al.*, 2021).

Based on the above analysis, it can be found that the not only safety, quality, price, but also appearance and performance of new energy vehicles are the issues that consumers focus on when purchasing. In this article, based on the planned behavior, I explore and discuss consumers' purchase intentions on new energy vehicles performance in a step-by-step way. At the same time, the relationship between the purchase intentions of new energy vehicles and consumers' planned behavior is determined using of actual demonstration, research, and analysis.

1.6.2 Government policies

If we review the development history of new energy vehicles, we can conclude that the development of new energy vehicles is inseparable from the support of government policies.

In the early 1990s, the United States, Europe, and Japan started the research on new energy vehicles and formulated long-term and short-term plans for the development of the new energy vehicle industry. In 2010, the United States formulated the promotion and popularization goal of new energy vehicles, using various subsidy policies to support the technological innovation of new energy vehicle enterprises, and encourage consumers to purchase and use new energy vehicles. New energy vehicle purchase tax, increase infrastructure construction, and some states have also passed bills to impose mandatory requirements on the sales ratio of new energy vehicles to promote the consumption of new energy vehicles. Germany released the National Electric Vehicle Development Plan in 2009 and set the development goal of achieving 1 million new

energy vehicles by 2020 (German Federal Government, 2009), and allocated funds and subsidies to promote the development and construction of new energy vehicles, and officially launched hydrogen in 2019 Pilot of fuel cell vehicles. Japan began to implement financial subsidies and tax reductions for new energy vehicles in 1998. Documents were released in 2010 and 2014, focusing on the development of hydrogen energy and fuel cells.

As for China, in 2019, funds were allocated to promote the electrification of public transport and trucks (Zuo, Zhao and Zhu, 2020). From the "Tenth Five-Year Plan" in 2000 to the withdrawal of the subsidy policy in 2020, China's policy on the new energy vehicle industry has shown three stages of "encouragement-support-adjustment". It is fully rolled out, and the models to be promoted have gradually shifted from commercial vehicles to passenger vehicles. In addition to investing huge funds to support technological innovation, it also implements preferential policies such as financial subsidies and tax subsidies for enterprises and individuals and increases the construction of charging infrastructure.

Aiming at the policy factors at the national level, scholars have researched on the policy of the new energy vehicle industry from various angles, focusing on the actual impact and effectiveness of the policy, the comparison of the pros and cons of different policies, and the adjustment and optimization of the policy.

Western scholars such as Bjerkan discuss how local policies in two Norwegian cities have affected the electric vehicle niche and find that local policies can enhance the comparative advantage of electric vehicles and increase the proliferation of electric vehicles by shaping infrastructure, user practices, and regulating rules (Bjerkan, Bjørge and Babri, 2021). Whitehead discussed many different policy tools aimed at promoting Plug-In Electric Vehicles on a global scale, he concluded that the policy package is part of a broader, long-term PEV rollout strategy and that the effectiveness of many policy tools must be tailored to PEV policies on the ground (Whitehead *et al.*, 2021). Kester et al conducted a qualitative comparative analysis of 227 semi-structured interviews with 257 transport and power experts from 201 institutions in 17 cities in the Nordic region to discuss the reasoning and arguments behind EV incentives and policy mechanisms. In conclusion, create strong policy and price incentives, and implement them in conjunction with local flexibility is significant to the development and promotion of new energy vehicles (Kester *et al.*, 2018). Santos et al. analyzed the UK total cost of

ownership including electric vehicles for 2017-2029. And found that subsidies will accelerate the popularity of some new energy vehicles and the penetration of battery electric vehicles in the mass market in the UK (Santos and Rembalski, 2021).

Scholars such as Li Guodong took Shanghai as the research object between 2016 and 2018 and used the monthly sales data of new energy passenger vehicle models in Shanghai to study the impact of the two policies of financial subsidies and free special licenses on the demand for new energy vehicles. The results show that the complete withdrawal of government promotion policies is likely to lead to a significant drop in demand (Li, Luo and Gu, 2019). Combining the Latent Dirichlet Allocation (LDA) topic model and econometric methods, Li et al. explored the underlying topics of numerous NEV policy documents and their implications for the promotion of NEVs at the city level. The results show that the total topic popularity significantly promotes the sales of new energy vehicles. And the popularity of the promotion subsidy topic is the strongest among the three types of topics. In addition, the prevalence of the promotion subsidy topic has an inverted U-shaped effect on the sales of new energy vehicles (Li *et al.*, 2021). Not only they confirmed so, Sheng and Xie conducted a questionnaire survey and analyzed the potential consumers of new energy vehicles, and concluded that since the development of new energy vehicles, government subsidies and purchase preferential policies have been an important factor affecting its development (Sheng and Xie, 2019). Through the research of Li Guodong et al. in Shanghai about the impact of the two policies of financial subsidies and free special licenses on the demand for new energy vehicles. they proved that a complete withdrawal of government promotion policies is likely to lead to a significant drop in demand (Li, Luo and Gu, 2019).

Gao Wei et al. (Gao and Xiao, 2020) and Wu Ke et al. (Wu and Li, 2020) both made a conclusion from their studies that government support can significantly promote the performance of new energy vehicle companies and increase the scale of new energy vehicle R&D and production, Wu ke thinks that the government's perfect subsidy system and high-quality supervision system can improve consumers' trust and purchase intentions for new energy vehicles.

Ouyang concluded that policymakers should introduce incentives to ensure a smooth transition to electrification for Chinese fleets (Ouyang, Zhou and Ou, 2021). Meanwhile Zhang et al. for the "Measures for Parallel Management of Average Fuel Consumption and New Energy Vehicle Points of Passenger Vehicle Enterprises". Based on the premise

of the "double integral" policy, and quantitatively analyze the comprehensive effect of the changes of policy factors, market factors, and cost factors on the results and the contribution of each factor. The research results show that: 1) The "double points" policy can effectively promote the development of new energy vehicles in China, and the policy effect is most obvious in a perfectly competitive market environment; 2) The tightening of the "double points" policy will bring a negative impact on auto manufacturers, and the impact on new energy vehicles is uncertain (Zhang *et al.*, 2020). Sun Xiaohua et al. thinks that for the consumer groups with lower annual household income, they normally have a better understanding of preferential policies, therefore the effect of government subsidies is more obvious (Sun and Xu, 2018).

Based on the current situation, the rapid development of China's new energy and electric vehicle industry has shifted from a policy-oriented strategy to increasingly weakened government policies. It is very important to understand the impact of local government financial subsidies on their consumption behaviour. Attention to local governments and preferential policies is also an important part of auto companies' sales strategies. This paper explores and analyses local government subsidies and attempts to find out the relationship between local government subsidies and consumers' intentions to buy.

Chapter 2 Model Construction and Research Assumptions

This chapter takes TPB as the main object, reviews many relevant literatures and empirical studies, and puts forward hypotheses based on these empirical studies.

2.1 Consumers' psychological factors

Chinese scholars Zhang et al. (Zhang, Liu and Lu, 2004) wrote in their study of Japan's auto industry policy that consumer behavior is a complex, multi-directional term that is not only the research object of economics, but also the research object of several other disciplines, such as consumer behavior acts simultaneously with people's psychological behavior and relates to people's thinking, emotions, and attitudes. At the same time, consumer behavior is also social behavior. What consumers buy is not only the use-value of the commodity but also the symbolic meaning of consuming it. Marketing defines consumer behavior as the sum of the consumer's decision-making process for acquiring, using, and handling goods or services before action. It can be concluded that regarding the market research of new energy vehicles, consumer psychology is an important aspect, including consumer values, consumer attitudes, and perceptions will have a direct impact on purchase intentions or purchase behavior. Discussion on consumer preferences, analysis of the formation of consumers' intentions to buy, and how to expand the market size of new energy vehicles according to consumer behavior. When the consumer groups are different, their personality traits are also different, and these characteristics are significantly related to personal perception. Personality traits are influenced by a person's cognition, attitudes, the people around them, and so on. Using the Theory of Planned Behavior as a research framework, Yan et al. (Yan *et al.*, 2019) and Du et al. (Du *et al.*, 2018) both reached a conclusion that positive and negative attributes of consumer attitudes, subjective norms, and perceived behavioral control have different effects on consumers' actual purchasing behavior. Chen et al. studied by incorporating social and cultural factors into the cognitive-behavioral model and concluded that customer perceived value, price factors, functional quality, and service quality have different degrees of influence on purchase intentions. Among them, service quality has significantly improved the concept of "face" (Chen *et al.*, 2019). Based on demographic characteristics, Hu Ping et al. pointed out that the popularity of new energy vehicles is often closely related to the age of the buyer, the price of the

vehicle, and the education level of the buyer (Hu *et al.*, 2020), meanwhile, Ma Shaohui believes that the education level of potential consumers and the income level is proportional to the purchase of new energy vehicles (Ma, Tan and Dai, 2013). Jiang and others agree that the potential consumers' understanding of new energy vehicles and consumers' environmental protection awareness are the main factors affecting consumption (Jiang and Sheng, 2017).

V. Vijai Krishnan conducted a case study in a representative town in India through a questionnaire to assess the impact of various attitudes factors on individual electric vehicle purchase intentions. Concluded that attitudes factors have a positive impact on EV purchase intentions (Krishnan and Koshy, 2021). Takanori Okada et al. investigated the intentions of non-EV owners and the post-purchase satisfaction of EV owners by conducting an online survey in Japan. And concluded that environmental awareness has a direct impact on the purchase intentions of non-electric vehicle users, and an indirect impact on the post-purchase satisfaction of electric vehicle users (Okada, Tamaki and Managi, 2019). Jonn & Kenneth studies the impact of social influence on the green consumption behavior hybrid electric vehicles for consumers behavior. In this study, interpersonal influence is defined as the individual (or family) perception and behavior that are influenced by other people through direct communication. The results of this study show that interpersonal influence plays a role in car buyers' identification with hybrid electric vehicle technology, and the closer the relationship is, the greater the influence (Aksen and Kurani, 2011).

To promote the development source of the new energy vehicle industry, the business community and academia have carried out in-depth research and analysis on the factors affecting the purchase intentions of new energy vehicles from different perspectives. The above analysis can be concluded that consumers' psychological factors. And those factors have an important impact on consumers' purchasing decisions. From the perspective of external factors affecting consumers' purchase intentions, the government's support policies for new energy vehicles, the quality, and performance of new energy vehicles are the top priorities.

In general, the influencing factors on the willingness to purchase new energy vehicles can be summarized into three perspectives: consumer psychological factors, product quality and performance, and government policies. Therefore, based on the previous research results, the questionnaire data, and the construction of the measurement

model, this paper will explore and compare the influencing factors of the purchase intentions of new energy vehicles through quantitative analysis, and finally put forward relevant suggestions.

2.2 Theory of Planned Behavior (TPB) (Ajzen) and research hypotheses

1) Literature review and definition of behavior planning theory (TPB)

The theory of planned behavior is a theory that explains the general decision-making process of individual behavior from the perspective of information processing and starting from the theory of expected value. TPB has been successfully applied in many behavioral fields, and most studies have confirmed that it can significantly improve the explanatory and predictive power of research on behavior.

The theoretical origins of the theory of planned behavior can be traced back to Fishbein's theory of multiattribute attitudes (Fishbein, 1963). The theory holds that behavioral attitudes determine behavioral intentions and expected behavioral outcomes and outcome evaluations in turn determine behavioral attitudes. Later, Fishbein and Ajzen developed the theory of multi-attribute attitudes and proposed the theory of rational behavior (Fishbein and Ajzen, 1975). Rational behavior theory believes that behavioral intention is the direct factor determining behavior, and it is affected by behavior attitudes and subjective norms. Because the theory of rational behavior assumes that individual behavior is controlled by the will, which seriously restricts the wide application of the theory, in order to expand the scope of application of the theory, Ajzen in 1985 added the control variable of perceived behavior on the basis of the theory of rational behavior, and initially proposed the theory of planned behavior (Ajzen, 1985).

The theory of planned behavior holds that behavioral attitudes determine behavioral intentions (Fishbein, 1963). Ajzen proposed behavior theory on this basis, and believed that behavior attitudes and subjective norms determine behavior willingness (Fishbein and Ajzen, 1975). Later, Ajzen expanded the scope of application based on rational behavior, that is, behavior is influenced by intention, and intention is determined by three factors: attitudes, subjective norms, and perceived behavioral control. External factors may also directly force or prevent behavior, regardless of intention, which depends on the degree to which the behavior is actually controlled by the individual, and the degree to which perceived behavioral control is an accurate measure of actual

behavior control, a relationship represented by the dashed line in the graph (Ajzen, 1985).

Ajzen's interpretation of the theory of planned behavior can be summed up as: the belief that individuals possess many behavioral beliefs but can only acquire relatively few behavioral beliefs in each time and context. These accessible beliefs are the cognitive and emotional basis for behavioral attitudes, subjective norms, and perceived behavioral control; personal and sociocultural factors (such as personality, intelligence, experience, age, gender, cultural background, etc.) indirectly influence behavior by influencing behavioral attitudes, subjective norms, and perceived behavioral control, which ultimately influence behavioral intent and behavior; behavioral attitudes, subjective norms, and perceived behavioral control are conceptually distinct, but sometimes they may share a common belief base, so they are both independent and related (Ajzen, 1985). The theory of planned behavior has the following main points:

- i. The behavior that is not completely controlled by the individual will is not only affected by the behavior intention, but also constrained by the actual control conditions such as the individual ability, opportunity, and resources to execute the behavior.
- ii. Accurate perceived behavioral control reflects the actual control condition, so it can be used as a surrogate measure of the actual control condition to directly predict the possibility of behavior (as shown by the dotted line in the figure below).
- iii. Behavioral attitudes, subjective norms, and perceived behavioral control are the three main variables that determine behavioral intentions. The stronger the control, the greater the behavioral intention, and vice versa.
- iv. The individual has many behavioral beliefs, but only a relatively small number of behavioral beliefs can be acquired at a particular time and environment, and these accessible beliefs are also called salient beliefs, they are the cognitive and emotional basis for behavioral attitudes, subjective norms, and perceived behavioral control.
- v. Personal and social and cultural factors (such as personality, intelligence, experience, age, gender, cultural background, etc.) affect behavior through Beliefs indirectly affect behavioral attitudes, subjective norms, and perceived behavioral control, and ultimately affect behavioral intentions and behavior.

- vi. Behavior attitudes, subjective norms, and perceived behavioral control are conceptually fully distinct, but sometimes they may share a common belief basis, so that they are both independent and related.

The theory of planned behavior is represented by a structural model diagram, as shown in figure 4.

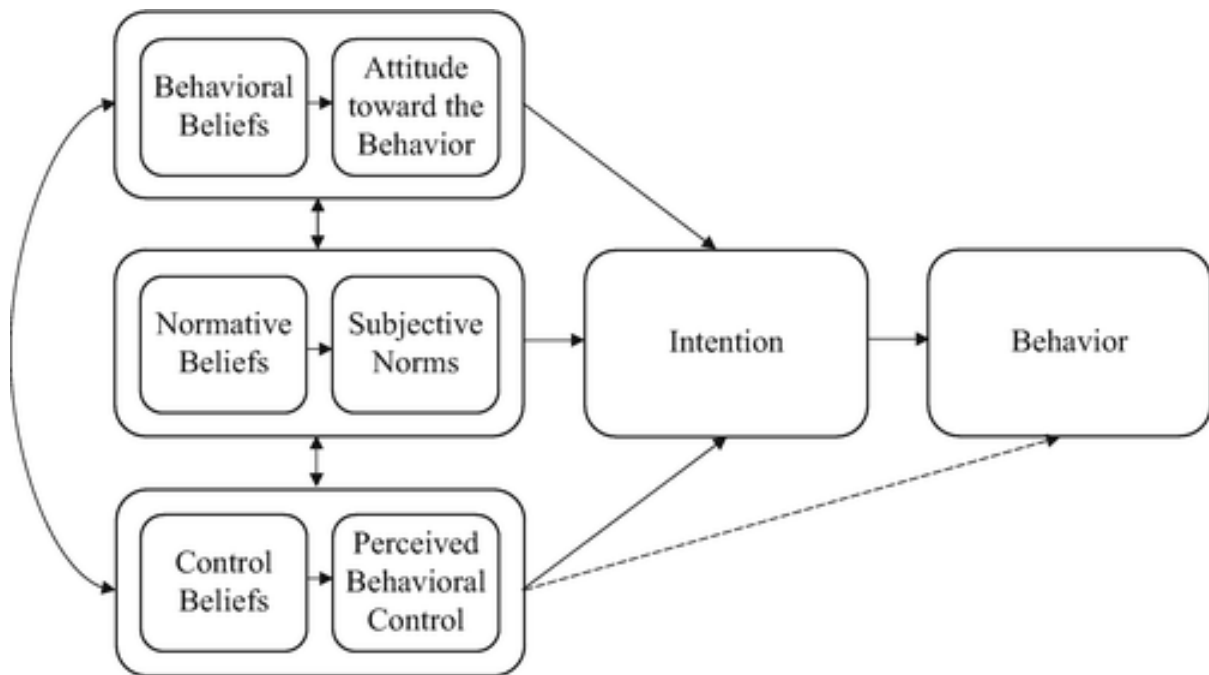


Figure 4 Theory of Planned Behavior (TPB) (Ajzen, 1991b) (Armitage and Conner, 2001)

Arafat et al. argue that the greater the beneficial behavior, subjective norms, and perceived control, the stronger the person's intention to perform the relevant behavior (Arafat and Mohamed Ibrahim, 2018). Zhu Zhixian believes that purchase intentions is not the same as purchase behavior. Purchase intentions is a psychological consultant for consumers to buy products that suit their needs. It is a manifestation of consumer psychology and a prelude to purchase behavior (Zhu, 1985), On the other hand, it means that the purchase intentions plays a crucial role in the occurrence of purchase behavior. Dodds and others believe that purchase intentions can represent the possibility that consumers are willing to buy the product. And he thinks that the higher the perceived value of the product, the greater the purchase intentions of the product (Dodds, Monroe and Grewal, 1991). From his conclusion, perceived value is an important factor in purchase intentions. Some scholars have also pointed out that there is still some

distance between the purchase intentions and the actual purchase behavior: Bagozzi et al. pointed out that purchase intentions refers to an individual's tendency to act on a product, which is not equivalent to purchase behavior (Bagozzi and Burnkrant, 1979). Regarding purchase intentions, researchers such as Han Rui and Tian Zhilong pointed out that whether consumers make a purchase decision for a certain product or comprehensive service is largely determined by their purchase intentions.

Another case, Li Huaqiang, Wu Chen and others used the theory of planned behavior system to analyze green travel intentions and behaviors, and concluded that all three factors of theory of planned behavior would affect residents' green travel intentions and behaviors (Li, Wu and Fan, 2018). Hoseason focused on defining the concept of consumer purchase intentions, and pointed out that it usually refers to the influence of external factors on consumers' purchase of a certain product or comprehensive service, and further proposed that this is a kind of consumption subjective perception (Hoseason, 2003). Shang Xiaohang carried out further research and analysis on the basis of previous research and analysis, and summarized several influencing factors of consumers' purchase intentions, including attitudes or evaluation (Shang, 2017).

2) A hypothesis of TPB

The reasons for purchase behavior may be very diverse, but the appearance of purchase intentions has already marked that purchase behavior may occur. Based on the above, it is hypothesized that:

H1: Consumer planning behavior theory has an impact on purchase intentions.

2.2.1 Consumer attitudes and research hypotheses

1) Literature review and definition

Behavioral attitudes are an individual's assessment of how much they like or dislike performing a particular behavior. According to the attitudes expectation value theory of Fishbein and Ajzen, individuals have many beliefs about the possible outcomes of their actions, which are called behavioral beliefs (Fishbein and Ajzen, 1975).

Scholars from all over the world have relevant studies on the variables of planned behavior. With the help of scholars' research, this paper roughly expounds the importance of three variables to planned behavior and purchase intentions.

Viardot's research points out that consumers' purchasing attitudes is the main factor affecting purchasing behavior. When consumers make purchasing decisions, they must go through a process of cognition-attitude-decision-making, in which attitudes will largely determine the behavior results (Viardot, 2004). Zhao Hongyan et al. used the structural equation model method to conduct an empirical study on how online evaluation affects brand loyalty and concluded that subjective norms and behavioral attitudes have a positive role in promoting brand loyalty, which in turn promotes consumers' purchase intentions (Zhao and Xue, 2015). Niray Tunçel used research results to confirm that there is a positive correlation between consumers' attitudes and their willingness to buy electric vehicles (Tunçel, 2021). Fei Ye's (Ye *et al.*, 2021) and Ali Vafaei-Zadeh et al. (Vafaei-Zadeh *et al.*, 2022) both concluded that attitudes, subjective norms, perceived behavioral control, have a positive impact on consumers' intention to purchase new energy vehicles. In addition to attitudes, subjective norms, and perceived behavioral control, some scholars have also studied the effects of awareness and cognition on purchase intentions: The research results of Chenung et al. shows that except for attitudes, consumers' positive green consumption awareness also have a positive impact on their green purchasing behavior (Cheung and To, 2019).

2) An assumption of Attitudes

Therefore, it can be concluded that attitudes can play a preconceived role in the formation of consumers' final purchase intentions, and consumers' attitudes towards new energy vehicle products has a positive impact on purchase intentions. Therefore, the following hypothesis is proposed:

H1a: Consumer attitudes and purchase intentions have a positive impact;

2.2.2 Subjective norms (SN) literature review and research hypotheses

1) Literature review and definition

Subjective norms refer to the pressure that an individual feels when deciding on behavior from friends, family, or other groups, the surrounding environment, and social norms, and because of these factors, the individual's behavior is affected. Fishbein and Aizen acknowledge and examine the idea that under the influence of social norms, such as the expectations of others, there may be a tendency to do something or act a certain way (Fishbein and Ajzen, 1975).

Scholars have conducted quantitative and qualitative research analysis on different topics based on behavioral theory. Chen and Li's empirical analysis found that in addition to attitudes, subjective norms also directly affect green travel willingness (Chen, Li and Guo, 2014). In addition, other variables were also included in the measurement: Diyi Liua, Huibin Du, etc. studied residents' low-carbon travel intentions and found that low-carbon transportation policies are mainly driven by attitudes, subjective and personal norms, and awareness of consequences, and attribution of responsibility to influence traveler intent (Liu *et al.*, 2017). Through empirical research, Li et al. found that the construction of subjective norms and perceived behavioral control will affect the willingness of Chinese college students to use car sharing (Li and Zhang, 2021).

2) An assumption of subjective norms

Based on the above, it is hypothesized that:

H1b: Consumers' subjective norms and purchase intentions have a positive impact;

2.2.3 Perceived behavioral control (PBC) literature review and research hypotheses

1) Literature review and definition of subjective norms

Perceived behavioral control reflects the status of actual control conditions. It is believed that perceived behavioral control is the degree of difficulty an individual feels about behavior, and reflects the individual's perception of the relevant factors that promote or hinder the occurrence of the behavior (Ajzen, 1991a).

The findings of Dong et al. show that, in addition to the effects of subsidy policies and car attributes, subjective norms, feelings and emotions, personal norms, and perceived behavioral control all affect the purchase intentions of urban households (Dong *et al.*, 2020). The study by He et al. concluded that perceived behavioral control is an effective factor in explaining low-carbon travel choice intentions among urban commuters (He, Jiang and He, 2019). Wang Jianhua et al. took safety-certified pork as an example, combined attitude-behavior-situation theory and perceived value theory to form an expanded model of planned behavior theory and analyzed the results. It is concluded that perceived behavioral control has a positive effect on behavioral intention (Wang, Gao and Chen, 2020). Liao Fen et al. explored the influencing factors of consumer food waste behavior from the perspectives of food and environment-related behaviors. The

results showed that perceived behavioral control played a positive role in influencing consumers' willingness to reduce food waste (Liao, Qing and Hou, 2020).

2) An assumption of perceived behavioral control

According to the empirical analysis of many scholars, perceived behavioral control is one of the important factors affecting purchase intentions. Based on the above, the following hypotheses are proposed:

H1c: Consumers' perceived behavioral control and purchase intentions have a positive impact;

2.2.4 Definition of purchase intentions

Although most studies support a high correlation between behavioral intentions and actual behaviors, behavioral intentions are not always the same as direct behavior. The researchers then refined behavioral intentions and believed that accurate implementation intentions were more predictive of actual behaviors than general behavioral intentions. Implementation intention refers to an individual's operational intention about when, where, and how to act. For example, scholars such as Ajze asked three groups of subjects to participate in a mailed questionnaire. The precise implementation intention group was required to indicate the exact date (accurate to the day) and delivery location of the return postage, while the general implementation intention group was required to indicate the approximate time (accurate to the week) and delivery location for the return post, while the control group was only required to complete the and send back the questionnaire. As a result, the actual return behavior of the precise implementation intention and general implementation intention groups was significantly higher than that of the control group, but they did not show significant between-group differences. This shows that the presence or absence of implementation intention affects actual behavior, and the degree of implementation intention does not differ (Ajzen, Czasch and Flood, 2009).

There are two main explanation mechanisms for the influence of implementation intentions on actual behaviors: one is that asking people to clarify their implementation intentions is equivalent to asking for a commitment instruction, and the process of people forming implementation intentions is also a commitment process to actual

behaviors. This increases the internal cause of the initiative in the implementation of the behavior and assists the actual implementation of the behavior (Gollwitzer, 1999)(Ajzen, Czasch and Flood, 2009); The second explanation is that the process of forming implementation intentions is also a process of improving the chronic accessibility of the target behavior. Implementing intentions decomposes behavior into specific steps and specific situations, which add many cues to the behavior. Once contextual cues appear, it is easy to reach the threshold of triggering a single implementation intention, which is then activated in sequence until the specific behavior is implemented; on the contrary, in the absence of implementation intentions, people may need to accumulate enough availability cues to provoke actual behavior (Gollwitzer, 1999).

Julian Hoseason (Hoseason, 2003) and Han Rui, Tian Zhilong and other researchers (Han and Tian, 2005) pointed out that whether consumers make a purchase decision for a certain product or comprehensive service is largely determined by their purchase, Han and Tian later proposed that comprehensive service is a subjective perception of consumers.

Based on the above analysis, relevant experts and scholars have analyzed the purchase intention based on different levels and angles, but in general, it is defined as the premise of the purchase behavior, that is, in most cases, the purchase will only occur when there is a purchase intention. This paper focuses on the influence of variables on the purchase intention of new energy vehicles under the framework of the theory of planned behavior.

2.3 Government policies review and research hypotheses

2.3.1 Review of government policies research

The policy is a kind of government management behavior with a strong purpose, which can guide and affect the administrative behavior from the macro level. Environmental protection issues have become a global issue, and government departments in various countries have issued corresponding policies and measures to positively guide consumers' environmental protection behavior and corresponding awareness. As an external situational factor, that is, an external environmental factor, government policies are mainly an objective external factor that directly or indirectly affects individual

behavior. If the situation is conducive to the occurrence of the behavior, the individual is more likely to perform the actual behavior (Guagnano, Sternand Dietz, 1995).

Regarding government policies, in recent years, to promote the development of new energy vehicles, many policies have been introduced one after another. Therefore, scholars' research is used to explore the impact of government policies on new energy vehicles on consumption willingness. Through empirical analysis, Sahoo et al. (Sahoo *et al.*, 2022) and Dong et al. (Dong *et al.*, 2020) both believe that subsidies and incentives have a significant impact on purchase intention. Jung et al. conducted research in the background of South Korea and found that the price of electric vehicles and charging subsidies and charging infrastructure are necessary conditions to influence the purchase of electric vehicles by Korean consumers (Jung *et al.*, 2021). Ozaki et al. conducted a questionnaire survey on consumers and found that the driving comfort and safety of electric vehicles are the most concerned factors when consumers choose to buy electric vehicles (Ozaki and Sevastyanova, 2011). The research of She Jinfeng et al. shows that the stronger the advertising and media publicity of electric vehicle manufacturers, the more sales channels, and the more consumers will be inclined to buy electric vehicles; Research by Yang Meiru et al. pointed out that various preferential policies issued by the government and the improvement of relevant infrastructure are important factors affecting the willingness of mass consumers to purchase. Therefore, increasing subsidies can effectively increase the market share of electric vehicles (Yang, Tan and Bi, 2013). Harrison and Thiel support the impact of policy incentives on the promotion of new energy vehicles (Harrison and Thiel, 2017).

Scholars from different countries have made empirical analyses on the relationship between their country's policies on new energy vehicles and consumers' intention to purchase. From the above analyses, it is undeniable that policies are important means to stimulate new energy vehicles.

Combined with the background of China's policy, China still mainly adopts policies and measures that focus on stimulating the development of the new energy vehicle industry in terms of economic policies and other aspects. According to the Chinese government's policies on new energy vehicles, in 2019, the government has sharply withdrawn the subsidy policy for new energy vehicles. The state's subsidies for new energy vehicles have been cut by more than half since June 26, 2019, and that year, the subsidy reduction rate exceeded 70%. According to statistical analysis of relevant data, the

average annual sales of new energy electric vehicles in China decreased by about 4% year-on-year at this time in 2019, totaling 1.206 million units. At the executive meeting of the State Council in October 2020, the new guidelines, and policies of the "New Energy Vehicle Industry Development Plan" were promulgated. China still expects to cultivate green industry development as a new growth breakthrough point. This plan affirms the important position of the development of new energy vehicles, and clarifies the key direction of the development of new energy vehicles, believes that the government should take positive measures to standardize the formulation of relevant supporting policies and regulations, and enhance and tighten safety control (Zhao, 2022).

Among the influencing factors of new energy vehicle purchases, government policies and guidance can not only influence behavioral intentions but also influence behaviors themselves by providing people with actual information. This information helps to form strong arguments to support their attitudes towards new energy vehicles; relevant government policies aimed at guiding urban residents to buy environmentally friendly vehicles can be used as incentives. Therefore, the government's publicity and guidance, the formulation and implementation of subsidy policies and the improvement of charging infrastructure cannot be ignored in the research on the purchase behavior of new energy vehicles. Based on this, this paper uses the theory of planned behavior, introduces "government policies" as a predictor variable, and fully explains the purchase intention of Suzhou residents' new energy vehicles from individual psychological factors and external situational factors, to understand their purchase intention more comprehensively.

2.3.2 Research hypotheses

This paper proposes current new energy vehicle consumption market policies in Suzhou based on the government policies in Jiangsu province. When the government policies are favorable to the consumption behavior of new energy vehicles, the consumer's willingness to consume will be stronger due to the influence of external scenarios. The following assumptions are put forward:

H2: The government's policies have an impact on the relationship between consumer planning behavior and purchase intention:

H2a: Government policies play a partial mediating role in the relationship between consumers' attitudes and purchase intention.

H2b: Government policies play a partial mediating role between consumers' subjective norms and purchase intention.

H2c: Government policies play a partial mediating role between consumers' perceived behavioral control and consumer willingness.

2.4 Perceived value review and research hypotheses

2.4.1 Definition

"Perceived value" originated from Peter Drucker's "The Practice of Management". He believed that the value brought by products to consumers determines consumers' consumption intention, and "value" is reflected through consumers' feelings and evaluations (Drucker, 2007). This view of highlighting product value provides a theoretical basis for subsequent research on the concept of consumer perceived value. Aasness and Odeck conducted online and offline surveys of residents and found that the factors that affect consumers' willingness to buy are the quality and cost of electric vehicle products (Aasness and Odeck, 2015). Through interview research and questionnaires, Zeithaml understands perceived value as a comparison based on gain and effort and then makes an overall evaluation of the utility that consumption can bring to oneself (Zeithaml, 1988). The definition highlights two characteristics: one is to highlight the trade-off relationship, that is, the comparison between consumers' income and payment for product consumption; the other is to emphasize subjective evaluation, the level of "value" is the subjectivity of consumers after self-evaluation. As a result, evaluation results may also vary from person to person. Woodruff proposed that perceived value is the subjective evaluation by consumers of the attributes and performance of the products or services they consume, and this evaluation is reflected in the process of consumption (Flint, Woodruff and Gardial, 1997).

As for the dimensions of perceived value, Sheth proposed the division method of social value, affective value, functional value, cognitive value and situational value (Sheth, Newman and Gross, 1991). Berry put forward four aspects: brand quality, service quality, price and society (Berry, 2000). Sweeney proposed that the value of durable goods is not only reflected in the attributes of the product itself, but also includes the utility that customers bring along with the cost reduction in the long-term use process, that is, the price value and function value and other aspects (Sweeney and Soutar, 2001).

Jiao Lina takes the mobile phone industry as the research object, explores, and verifies the dimensions of perceived value, and analyzes the influence of each dimension on consumer behavioral inclinations. Jiao divided perceived value into health value, incentive value, emotional value, service value and condition value (Jiao, 2008). According to Koehn's research, customer perceived value is the consumers' experience. This experience reflects the characteristics of relativity and interaction. Relativity means that consumption of the same product or service makes different choices in different contexts. Interactivity means that when they consume or select goods, they will obtain corresponding value by interacting with goods; preference means that consumers are more likely to consume products or services that can meet their needs, so that they can obtain more value (Koehn, 2013). Zhou Yijin reviewed the related research on green products and customers' perceived value, and proposed a new dimension, namely, a new dimension of customer perceived value of green products, that is, the dimension of green value. And through analysis, it is concluded that functional value has the greatest impact on consumers' purchase intention, followed by the green value (Zhou, 2006). Fan Xiucheng and Luo Haicheng pointed out that the perceived value of customers is mainly manifested in three aspects: social value, product function, and experience. After gradually refining it, it is found that the functional value mainly includes: product price, quality reference standards and other aspects of the content (Fan and Luo, 2003). Wu et al. argue that battery life, mileage, and charging are the main factors influencing purchasing behavior, and that perceived benefits and associated infrastructure improvements can positively influence consumers' NEV purchase intention (Wu, Liao and Wang, 2020). Driving mileage and battery life are one aspect of the perceived value of new energy vehicles. The functional value and service value of new energy vehicles are closely related to innovation. Niray Tunçel believes that consumers with high hedonic motivation and innovation have a positive attitude towards purchasing electric vehicles, and those with high cognitive motivation to innovate are likely to buy EVs (Tunçel, 2021). Hedonic motivation, in other words, reflects the functional value of new energy vehicles. When scholars such as Li Shuxian explored and discussed the relationship between customer perceived value, and customer loyalty on the UGC mobile short video platform, they differentiated perceived value and divided it into three categories: experience value, social value and functional value (Li, 2018).

2.4.2 Dimensions

Taken together, researchers were able to differentiate the dimensions of people's perceived value by using a variety of taxonomies. The perceived value of this paper is the subjective evaluation and overall perception of consumers on the utility of a certain consumption behavior. In this paper we take four dimensions from Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008), Li Jialin (Li, 2010).

These four aspects as main variables of perceived value:

- i. Price value: It reflects the customer's perceived benefit from the product's short-term or long-term cost savings.
- ii. Quality value: It means that when consumers use it, it can bring consumers enough sense of security and trust. For example, the battery life of new energy vehicles, the safety factor, and the comfort brought by driving.
- iii. Function value: It expresses the physical attributes of the product that satisfy the purpose or functional purpose. These attributes form the basis for evaluation by customers when purchasing a product. For example, the life of the battery of the new energy vehicle, the endurance, and the sense of security it brings to the driver when driving.
- iv. Service value: It refers to the information consultation provided before the sale of the product, along with the physical sale of the product, various additional services provided by the enterprise to the customer, including product introduction, delivery, installation, debugging, maintenance, technical training, product guarantee, and work. The value generated by the attentive service of personnel, etc.

2.4.3 Research hypotheses

Taken together, it is assumed:

H3: Perceived value plays an influential role in the relationship between planned behavior and purchase intention:

H3a: Perceived value plays a partial mediating role between consumers' attitudes and purchase intention.

H3b: Perceived value plays a partial mediating role between consumers' subjective norms and purchase intention.

H3c: Perceived value plays a partial mediating role between consumers' perceived behavioral control and purchase intention.

Chapter 3 Research design

3.1 Research model construction

Research on the purchase intention of new energy vehicles and its influencing factors has been widely discussed around the world. However, there are differences in different countries due to differences in economy, politics and culture, and different cities have different economic development, policies, cultures, and consumer psychological behaviors. Therefore, it is necessary to conduct research and research in a specific city, Suzhou, in the context of China.

This chapter first reviews the relevant analysis of the concept of consumers' specific behavior theory and analyzes the influencing factors of Suzhou consumers through the review of classic theories. The research process of this paper is based on the theory of planned behavior (Ajzen, 1991a). The influence of consumers' attitudes, subjective norms, and perceived behavioral control factors, as well as behavioral intentions on consumers' purchase intention of new energy vehicles, was discussed. Combined with government policies as an external factor, this paper analyzes the impact of government new energy vehicle policy support and publicity on consumers' willingness to buy new energy vehicles. In addition, according to the research of scholars, this paper adopts four dimensions of perceived value based on the Chinese market, these are price value, quality value, functional value, and service value. The influence of consumer value price, quality value, functional value, and service value on purchase intention is analyzed under the theory of planned behavior. Meanwhile this paper focuses on the analysis of the moderating effect of government policies and perceived value between the theory of planned behavior and purchase intention. By sorting out the characteristics of the consumption behavior of new energy vehicles, starting from theories and facts, it analyzes and combines a variety of theories to discuss the impact of each theory on residents' willingness to purchase new energy vehicles.

As a result, a framework of influencing factors of new energy vehicle consumption is established with Suzhou City, China as the background. According to the content, the model proposed for this study is shown in figure 5.

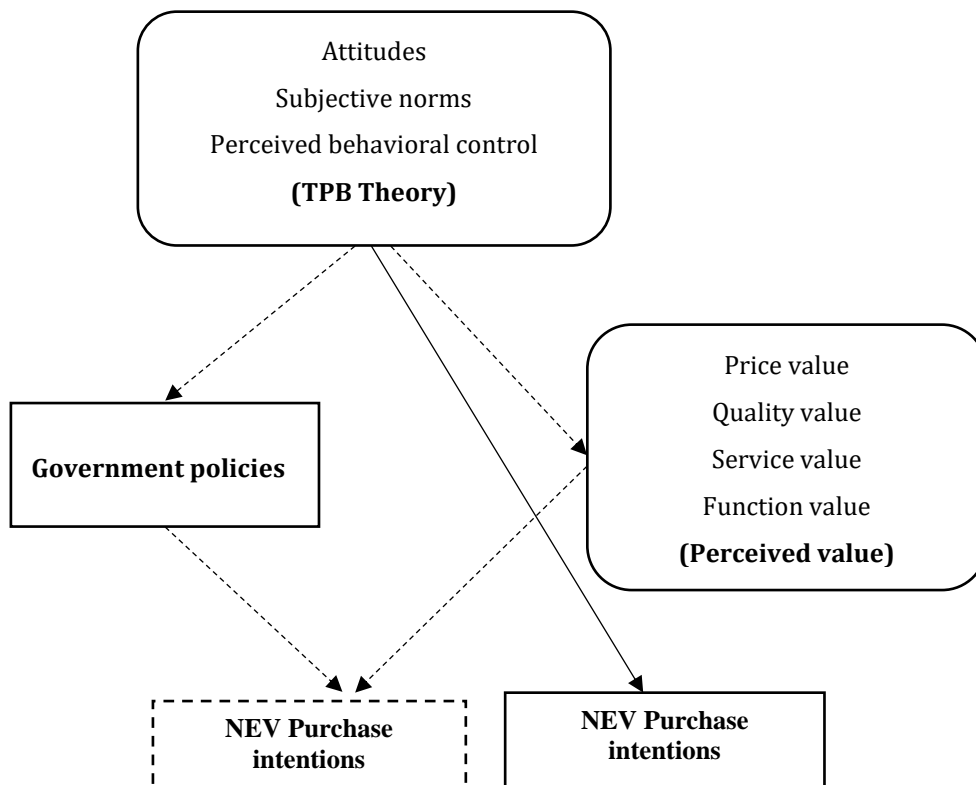


Figure 5 Research model building (own elaboration)

3.2 Model assumptions table

According to the framework above and the previous assumptions, based on the theory of planned behavior, combined with the impact of perceived value and government policies on consumption willingness, the corresponding hypothetical items are listed separately, as shown in table 1:

Variables	Hypothetical description
	H1: Consumer planned behavior theory has an impact on purchase intention;
H1	H1a: Consumers' attitudes have a positive impact on purchase intention;
	H1b: Consumers' subjective norms have a positive impact on purchase intention;
	H1c: Consumers' perceived behavioral control has a positive impact on purchase intention;

	H2: Government policies guidance has a positive impact on the relationship between consumers' planned behavior and purchase intention;
H2	H2a: Government policies play a partial mediating role in the relationship between consumers' attitudes and purchase intention;
	H2b: Government policies play a partial mediating role between consumers' subjective norms and purchase intentions;
	H2c: Government policies play a partial mediating role between consumers' perceived behavioral control and purchase intentions.
	H3: Perceived value plays an influential role in the relationship between planned behavior and purchase intentions;
H3	H3a: Perceived value plays a partial mediating role between consumers' attitudes and purchase intentions;
	H3b: Perceived value plays a partial mediating role between consumers' subjective norms and purchase intentions;
	H3c: Perceived value plays a partial mediating role between consumers' perceived behavioral control and purchase intentions;

Table 1 A summary of the final research hypotheses

3.3 Research model building

Based on the research framework of previous scholars, this paper investigates and researches the purchase intentions of new energy vehicles of Suzhou residents, based on the theory of planned behavior, consumer perceived value, and the government policies as the mediating variables of consumers' willingness to purchase new energy vehicles. Through analyzing the influence of different factors on consumers' consumption decisions and discussing the internal mechanism of each factor on residents' willingness to purchase new energy vehicles, the influencing factors of consumer behavior that cause consumers to buy new energy vehicles are studied. In the form of a questionnaire survey, this topic uses a combination of qualitative and quantitative research methods to study the consumption behavior of Suzhou residents' new energy vehicles from the perspective of consumers' purchase intentions and to explore the current Suzhou residents' purchase intentions and influence on new energy vehicles. The purpose is to provide decision-making suggestions for relevant departments and provide business inspiration for enterprises in the new energy vehicle industry.

3.4 Designing ideas

This paper adopts the empirical analysis method in the research process, and the empirical analysis method is based on the questionnaire survey, so the questionnaire survey method is used to collect the data. Find out what the respondents are or ask for their opinions by designing a unified questionnaire. This study uses the Likert five-point scale for questionnaire design, which was developed by American social scientist Likert in 1932 based on the original aggregate scale (Likert, 1932). From the actual form of the Likert five-point scale, it can provide respondents with a more complete description, each description can be divided into "strongly disagree", "disagree", "not sure", "agree", and "strongly agree". The five response modes are "1", "2", "3", "4" and "5". Finally, the scores of different items are added up, and the values need to be processed by equation statistics, and then the attitudes of the respondents to the relevant issues can be obtained, the answers are relatively fixed, and the obtained data can be summarized and analyzed.

To ensure the validity and reliability of the questionnaire, the questionnaire has been discussed and revised many times. First, some items that can be used to measure variables are collected from many relevant kinds of literature, and these items are organized according to the results of actual interviews with passengers, to avoid items that may cause ambiguity or revise the misinterpreted words, make sure that the items can correctly express the expected content and form a preliminary questionnaire; meanwhile deleting items that are vague and similar in meaning after referring to the research of many scholars. Then, conduct a small-scale pre-investigation on the initial questionnaire, adjust unreasonable items according to the reliability and validity test results, delete junk items, ensure the one-dimensionality of variables, and finally obtain a formal questionnaire. After the investigation of this subject, all relevant data obtained from this questionnaire survey will be counted, and the questionnaires will be statistically and simply classified using Excel and SPSS statistical software. Finally, according to the survey results, the influencing factors of Suzhou residents' new energy vehicle purchase intentions are analyzed. Analyze and make relevant recommendations. The object of this questionnaire survey is the consumption behavior of new energy vehicles by residents of Suzhou City, Jiangsu Province, and the survey is in Suzhou City. This questionnaire survey adopts two methods, one is to distribute questionnaires

through the online channel of Wenjuanxing, and the other is to send questionnaire links through social platforms such as WeChat and Weibo, to collect as many questionnaires as possible to meet research needs. In this study, due to the epidemic, the form of offline leaflet distribution is not allowed in Suzhou, so the Internet is used to disseminate the questionnaire. Therefore, this questionnaire was disseminated in the WeChat group gathered by Suzhou people, and the age was relatively scattered. The questionnaire was first developed in English and then translated into Chinese. The questionnaire was sent to two WeChat groups with a total number of 500 people. When sending the questionnaire, a message was edited and the topic was explained without mentioning the specific problem, to avoid the bias problem. The questionnaires were repeatedly sent on these social media for 21 days, and 350 valid questionnaires were collected. The survey was conducted from April 25 to May 15, 2022.

3.5 Variable selection

The research of this paper is inseparable from the support of the questionnaire. According to the research goals and needs, this paper has formulated a highly targeted questionnaire, and the questionnaire is only aimed at the Chinese city of Suzhou, to understand the actual situation of Suzhou consumers on new energy vehicles. The questionnaire designed in this paper refers to the research literature on new energy vehicles worldwide and selects the scales with higher use value among the many references. In addition, this paper also based on the national part of the content has been revised based on existing policies and consumer conditions to ensure that the questionnaire is highly compatible with the current situation in Suzhou. In view of the lack of mature scales in other literatures, this paper compiles according to the measurement content, and tests the validity and reliability of the compiled content to ensure that these scales and questionnaire items have high credibility. The questionnaire used in this paper can be divided into five parts:

In the first part, the content of this part is mainly to explain the research purpose of the questionnaire, data confidentiality and other aspects, introduced definitions of new energy vehicles based on the market in China. It also explained the purpose of the questionnaire, so that the respondents have a clear understanding of the subject of the questionnaire.

The second part is the demographic survey, which mainly investigates the age, marital status, education, and income of the respondents.

The third part is the investigation of the theoretical model of planned behavior. Therefore, the third part contains nine variables: Attitudes (ATT), Subjective Norms (SN), Perceived Behavioral Control (PBC); Government Policies (GP), Price Value (PV), Functional Value (FV), Quality Value (QV) and Service Value (SV); and finally, Purchase Intentions (PI). This part mainly investigates the awareness of Suzhou consumers on new energy vehicles, to understand their attitudes, new energy vehicle attitudes mainly refer to the consumer's awareness of the behavior of purchasing new energy vehicles. This part of the content refers to the scale developed by Maloney (Maloney and Ward, 1973); the subjective norms variable mainly reflects the consumers' willingness to purchase new energy vehicles due to the pressure of the surrounding groups. The perceived behavioral control part mainly refers to the scale developed by Park and Lessig (Park and Lessig, 1977); the perceived behavioral control variables mainly affect consumers' perception of obstacles or facilitation in purchasing new energy vehicles, and then understand the level of government support for new energy vehicles. With reference to the scale developed by Wang Yuehui and Wang Qing (Wang and Wang, 2013).

Variable name	Measurement item	Source
Attitudes (ATT)	I think new energy vehicles are satisfactory.	Maloney (Maloney and Ward, 1973), Park and Lessig (Park and Lessig, 1977), Wang Yuehui and Wang Qing (Wang and Wang, 2013)
	I think the development of new energy vehicles is our responsibility to the environment and the future.	
	Purchasing and using eco-friendly products is vital to protecting the environment.	
	I think new energy vehicle travel can help improve the environment.	
Subjective norms (SN)	There are many people around me who have bought new energy vehicles.	Maloney (Maloney and Ward, 1973), Park and Lessig (Park and Lessig, 1977), Wang Yuehui and Wang Qing (Wang and Wang, 2013)
	My family approves of my purchase of a new energy vehicle.	
	Many of my friends encouraged me to buy new energy vehicles.	
	People who have an influence on my behavior (family and friends) think I should buy an NEV.	
Perceived behavioral control (PBC)	I am financially able to buy a new energy vehicle.	Maloney (Maloney and Ward, 1973), Park and Lessig (Park and Lessig, 1977), Wang Yuehui and Wang Qing (Wang and Wang, 2013)
	The purchase of new energy vehicles mainly depends on my will, without interference or restrictions from others.	
	I think it is more economical to buy new energy vehicles.	

It is very convenient to buy new energy vehicles, and information can be obtained everywhere.

I understand the information (brand, product, price, performance, etc.) of new energy vehicles.

Table 2 Planned behavior measurement scale

Based on the above assumptions, this paper is based on three variables from TPB theory and adopted four variables from perceived value, and government policies as another variable. For perceived value, this paper includes four dimensions: price value (PV), quality value (QV), functional value (FV), service value (SV). Relevant questionnaires are designed with references from many scholars such as Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008). It is also referred to as the related measurement items on the perceived value of new energy vehicle consumers in the research by Li Jialin of the perceived value of new energy vehicle consumers (Li, 2010). Adjusted in combination with new energy vehicles and designed the measurement scale shown in table 3.

Variable name	Measurement item	Source
Price value (PV)	I think the price of new energy vehicles is within an acceptable range.	Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008), Li Jialin (Li, 2010).
	I think it is very economical to use new energy vehicles.	
	I think the post-maintenance maintenance of new energy vehicles is economical.	
	New energy vehicles can meet my travel needs.	
Quality value (QV)	I feel that the use of new energy vehicles is quiet and comfortable to drive.	Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008), Li Jialin (Li, 2010).
	I think the battery life of new energy vehicles is long.	
	I think new energy vehicles have a high safety factor.	
Service value (SV)	I think the staff of new energy vehicle companies should be friendly and provide quality service.	Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008), Li Jialin (Li, 2010).
	I think new energy vehicles have a complete pre-sale and after-sale service system.	
Function value (FV)	I think new energy vehicles are more convenient to use than traditional vehicles.	Sweeney&Soutare (Sweeney and Soutar, 2001), Fan Xiucheng and Luo Haicheng (Fan and Luo, 2003), Yang Xiaoyan and Zhou Yijing (Yang and Zhou, 2006), Jiao (Jiao, 2008), Li Jialin (Li, 2010).
	I think the appearance of new energy vehicles is beautiful and fashionable.	
	I think the internal operation of new energy vehicles is very intelligent.	
	I think new energy vehicles can reduce environmental pollution and damage and improve the ecological environment.	

Table 3 Measurement scales of perceived value

Regarding some policy indicators of the government, following the policies of Jiangsu Province and the Suzhou Municipal Government, we have considered various aspects such as strengthening the construction of new energy charging stations and reducing taxes. And according to the above-mentioned documents promulgated at the national level according to the current initial stage of new energy vehicle development.

Variable name	Government policies
Government policies	When buying a car, I will consider the government's policies such as car purchase subsidies and tax cuts for the purchase of new energy vehicles.
	When buying new energy vehicles, I will consider the government's promotion of new energy vehicles.
	When buying new energy vehicles, I will consider the government's construction of charging piles for new energy vehicles.
	When I buy a new energy vehicle, I will consider the parking fee reduction and exemption of the Suzhou government, and the policy of unlimited travel.

Table 4 Measurement scales for government policies

Finally, in terms of purchase intentions, this paper is based on research by Dodds et al. (Dodds, Monroe and Grewal, 1991), three questions were selected, as shown in table 5.

Variable name	Purchase intentions
Purchase intentions	My next car will be a new energy vehicle.
	Compared with traditional cars, I prefer to give priority to new energy vehicles.
	I will recommend my friends to buy new energy vehicles.

Table 5 Purchase intentions measurement scale

Chapter 4 Empirical Analysis

4.1 Descriptive statistical analysis

This survey questionnaire was issued for 21 days, and the questions involved in the questionnaire covered some basic identifying information about the respondents, such as gender, age, educational background, marital status, and income. Although these issues are not the focus of our research, some important rules can be found through a simple statistical description of this basic information, which can also be helpful for our related data discussed below. The basic distribution statistics for the test are shown in table 6.

Table 6 Demographic variables analysing (own elaboration)

Basic statistics	Variables	Frequency(N)	Frequency (%)
Gender	Male	76	34.39%
	female	45	65.61%
Age	under 25	65	29.41%
	26-30 years old	41	18.55%
	31-35 years old	49	22.17%
	36-45 years old	42	19%
	above 45	24	10.86%
Marriage statue	married	118	53.39%
	unmarried	102	46.15%
	(null)	1	0.45%
Education	below high school	9	4.07%
	before college	4	1.81%
	college	33	14.93%
	bachelor	128	57.92%
	master	39	17.65%
	doctor	2	0.9%
	other	5	2.26%
	(null)	1	0.45%
Annual income (RMB)	less than 50,000	13	5.88%
	5-100,000	47	21.27%
	10-200,000	62	28.05%
	More than 200,000	94	42.53%
	(null)	5	2.26%

From table 6, we can see the basic identity and background information of the investigators. In terms of gender, the proportion of males and females is quite different. Among them, men account for 34.39% and women account for 65.61%. In the question of age, we divide it into five stages, namely under 25 years old, 26-30 years old, 31-35 years old, 36-45 years old, and over 45 years old. Under the context of Chinese society, 30 years old is a period of stable personal life, instead of 35 years old, most people have a stable family already, and personal career is also on the rise, and 45 years old means a very stable family and career, the proportions are 29.41%, 18.55%, 22.17% respectively, 19%, 10.86%. Groups at each stage have different attitudes and purchasing power towards new energy vehicles. Educational background is divided into 8 options, below high school (4.07%), before college (1.81%), college (14.93%), bachelor (57.92%), master (17.65%), doctor (0.9%), other (2.26%) and null (0.45%). Different educational backgrounds will also have an impact on the survey of new energy vehicles. Groups with higher education may have a clearer understanding of car information and can more rationally evaluate various factors that affect purchasing attitudes. I divide the income into five grades, less than 50,000(5.88%), 5-100,000(21.27%), 10-200,000(28.05%). More than 200,000(42.53%) and null (2.26%). Regarding the null option, some respondents were reluctant to disclose such information because they respected the respondents' choices. And most people's income is more than 200,000, which is surprisingly higher than it was expected. While the educational background of the respondents is mainly undergraduate and graduate students, and the majority age is under 25 years old and 31-35 years old, which is matching their identities.

4.2 Questionnaire survey reliability and validity test

4.2.1 Reliability test

To test the stability and reliability of the questionnaire, we use Cronbach's Alpha to test and judge the reliability the questionnaire. Generally speaking, the larger the Alpha coefficient, the greater the correlation between the various question items constituting the scale, the better the reflection effect, and the higher the reliability of the scale (DeVellis, 2011). If the α coefficient is below 0.65, the reliability of the questionnaire is very low and unacceptable; when the α coefficient is between 0.65 and 0.7, which is the range that the reliability of the questionnaire is barely acceptable; if the α coefficient is

between 0.7 and 0.8, the reliability of the questionnaire is relatively good; and when the α coefficient is above 0.8, indicating that the reliability of the questionnaire is very good. This paper uses SPSS to test the reliability of nine variables: attitudes towards new energy vehicles, subjective norms, perceived behavioral control, purchase intentions, price value in perceived value, quality value, service value, function value in perceived value, and government policies. The results are as follows the table shows:

Table 7 Demographic variables analysing (own elaboration)

Factor	Items	α
New energy vehicle attitudes	1-4	0.924
Social norms	5-8	0.907
Perceived behaviour control	9-13	0.913
Price Value	17-20	0.889
Quality value	21-23	0.917
Service value	24-25	0.834
Function value	26-29	0.900
Government policies	30-33	0.895
Purchase intentions	14-16	0.905
General questionnaire	-	0.957

Through the calculation of each variable, the reliability value of all variables is greater than 0.7, so it is concluded that the reliability of the questionnaire meets the requirements. Among them, the attitudes, subjective norms, perceived behavioral control, quality value, functional value, and purchase intentions variable α value exceeds 0.9, indicating that the questionnaire items and the final survey data have high internal consistency, indicating that this questionnaire survey has good reliability.

4.2.2 Validity test

1) Factor analysis of independent variables

Validity analysis includes content validity and constructs validity. Content validity refers to whether the designed questionnaire is logical, and whether the presentation and setting of the items are simple and easy to understand, reasonable, and representative. Since the development of the scale in this paper is based on the classic scale, and after reading, sorting out, and summarizing relevant research, and drawing on the mature

classic scale to compile, after the completion of the initial scale, 20 people were also invited to test the content of the questionnaire and put forward suggestions for revision. , according to the opinions, amend the questions with unclear meaning and ambiguity, and try to make the meaning of the questionnaire questions clear, complete, and easy to understand, to facilitate the accurate understanding and answer of the general public. Therefore, this questionnaire has good content validity.

Construct validity refers to the degree of correspondence between a certain characteristic reflected by the results of measurement statistics and the measurement value, that is, whether the content of theoretical assumptions can be truly reflected through questionnaires. Construct validity is an important indicator to detect whether there is consistency. This study uses exploratory factor analysis to test whether the observation items proposed in the designed questionnaire belong to the corresponding variables and to verify whether the scale structure of the questionnaire is reasonable. The data from the questionnaire were first subjected to KMO and Bartlett's tests of sphericity. Results depended on suitability for exploratory factor analysis.

In the analysis of this paper, an exploratory factor is used to carry out the validity analysis, and it is divided into two steps: firstly, all data samples are tested by Bartlett's tests of sphericity and KOM, if the Bartley sphere significance of the test result is lower than 0.001, and the KOM value is close to one, then the questionnaire is suitable for factor analysis (Zhang, Feng and Sheng, 2013). This paper uses SPSS to carry out KMO and Bartlett's tests of sphericity on the scales of the four dimensions respectively. The KMO of the behavior theory scale is 0.899; the KMO of the customer perceived value scale is 0.887; the KMO of the government policies scale is 0.812; the purchase intentions scale KMO is 0.745. The average error value of the measurement load accuracy between each measurement factor is greater than 0.5, indicating that the scale of this factor is highly valid. The specific results of factor analysis can be seen in table 8 below.

Table 8 Variables validity analysis results (own elaboration)

Variables	Factors loading									
	1	2	3	4	5	6	7	8	9	10
ATT	0.896									
	0.844									
	0.805									
	0.833									
SN		0.834								
		0.727								
		0.796								
		0.768								
PEC			0.852							
			0.806							
			0.709							
			0.710							
			0.767							
PV					0.747					
					0.712					
					0.741					
					0.713					
QV						0.867				
						0.865				
						0.777				
SV							0.728			
							0.785			
FV								0.777		
								0.813		
								0.804		
								0.696		
GP									0.760	
									0.739	
									0.765	
									0.795	
KMO value				0.933						
Bartlett's Sphericity Test					Approximate Chi-Square		8772.729			
					df		528			
					Sig.		0.000			

It can be seen from the above table that the common degree values corresponding to all research items are higher than 0.7, indicating that the information of the research items can be effectively extracted. In addition, the KMO is 0.933, which is greater than 0.6, which means the data can be effectively extracted. In addition, the variance explanation rate values of the 8 factors are 11.603%, 10.826%, 9.967%, 9.629%, 8.624%, 8.430%, 7.175%, 4.449%, and the cumulative variance explanation rate after rotation is 80.379% > 50%. It means that the information of the research item can be extracted effectively.

Table 8 classifies each item into 8 factors based on names "price value", "quality value", "functional value", "service value", "government policies". Variables from TPB theory namely "attitudes", "subjective norms", and "perceived behavioral control", in which the items included in each factor are 1-4, 5-8, 9-13 respectively, 17-20, 21-23, 24-25, 26-29 and 30-33, which are consistent with the content of the scale. And the factor loading coefficients are all greater than 0.7, according to the factor loading coefficients, the factors and research items can be confirmed the relationship corresponds, as expected, so the validity of the scale can be confirmed to be good.

2) Factor analysis of dependent variables

By sorting out the data of the dependent variable of the questionnaire, and using SPSS to test the data, it can be obtained that KMO = 0.745 (>0.7) and Bartlett's Test of Sphericity = 0.000 (<0.001). The specific calculation is shown in table 9. From the above test results, all of them have reached the test standard, and thus the next factor analysis can be carried out.

Table 9 Dependent variables KMO and Bartlett's Test of Sphericity (own elaboration)

KMO and Bartlett's Test of Sphericity		
KMO value		0.745
	Approximate Chi-Square	633.759
Bartlett's sphericity test	df	3
	Sig.	0.000

The principal component analysis method was used to carry out factor analysis, the eigenvalue was set to be greater than 1, and a common factor was extracted, and the calculated cumulative variance contribution value was 74.521% (greater than 50%). So,

the factor analysis has a good explanation. The maximum tolerance is used again to calculate the factor rotation. The settlement result shows that the factors of each item in the questionnaire are all greater than 0.5, which also shows that this variable can effectively reflect the scalar of the questionnaire items. Through analysis, a factor is obtained, which represents the purchase intentions of the dependent variable, which is consistent with the assumption theory at the beginning of the research. Therefore, it can be concluded that the dependent variable of the questionnaire has good structural validity. The specific calculation and analysis conditions are shown in table 10.

Table 10 Factor analysis of dependent variables (own elaboration)

Dependent Variables	Factor loadings	Cumulative variance contribution rate%
	0.934	0.872
Purchase Intention	0.909	0.827
	0.907	0.822

Table 10 classifies each item of purchase intentions; three items are corresponding to the questionnaire 14-16, which are consistent with the content of the scale.

4.3 Descriptive analysis

We focus on nine variables involved in the questionnaire: consumer attitudes, subjective norms, perceived behavioral control, purchase intentions, price value, quality value, service value, functional value, and government policies. A simple descriptive statistical analysis was carried out, mainly including the median, mean and standard deviation of each item, as shown in table 11.

Table 11 Descriptive analyses (own elaboration)

variables	median	SD	mean
Attitudes	4.000	1.090	3.885
Subjective norms	3.500	1.124	3.318
Perceived behaviour control	3.800	1.141	3.611
Price value	3.500	1.146	3.423
Quality value	3.333	1.153	3.219
Service value	3.500	1.097	3.360
Function value	3.500	1.166	3.433
Government policies	4.000	1.166	3.599
Purchase intentions	3.333	1.190	3.389
<i>N=325</i>			

In this questionnaire, the minimum value of 33 items is less than 3 standard deviations from the mean value, and the maximum value (min/max value) exceeds the mean value by 3 standard deviations, indicating that the data fluctuates greatly, relative to the mean value. By using the median description, the overall level is more suitable, so in this paper, I analyse the median.

In the measurement questions about attitudes, the median of the four questions is higher than 4, indicating that the respondents generally have a positive attitude towards new energy vehicles, and they all believe that they undertake the social responsibility to improve the environment, and the respondents generally support the model of low-carbon travel.

In the variable of subjective norms, the median of the item "My family members approve of my purchase of new energy vehicles" value is 4, indicating that the respondents value their family members more and think that people around them will not affect their purchase intentions and behavior is relatively weak.

In the variable of perceived behavioral control, the median of the question items is above 4, indicating that the respondents mainly give relatively high affirmation to the perceived behavioral control that they can decide their travel tools. The high degree of

approval indicates that the respondents have obvious control over the perceived behavior of new energy vehicles.

For the variable of purchase intentions, the median value is 4, indicating that the respondents are more willing to purchase new energy vehicles, and are willing to recommend them to others around them. Based on the situation in China, young people are more willing to accept new technologies, and NEV has been catching their attention. Among the variables of perceived value, respondents believe that the functional value of new energy vehicles is very important, with a median value of 4, followed by a quality value, and the weakest perception of service value of new energy vehicles, with a median value of 3. Therefore, we conclude that new energy vehicle companies should strive to innovate the value of vehicle functional attributes and should strictly monitor the quality of new energy vehicles while striving to innovate.

In terms of policy factors, the respondents are very concerned about the government's subsidies and tax reduction policies for new energy vehicles. It can be judged that most of the respondents to the questionnaire are rational consumers, and we can also conclude that the implementation of the subsidy policy can promote the consumers' intentions to purchase new energy vehicles.

4.4 Correlation analysis

4.4.1 Correlation analysis of theoretical framework

Correlation analysis is the study of the degree of correlation between two or more variables. The value range of the correlation coefficient r is between -1 and +1. When r is closer to -1 or +1, the relationship between variables is closer; when r is closer to 0, the relationship between variables is on the contrary. In this paper, the Pearson correlation analysis method is used to analyze the correlation between the variables in the model. First, the weighted average of all the items of the 3 variables in the model is carried out. The specific analysis shows that all items between purchase intentions and government policies, TPB, perceived value are significant, the correspondent correlation coefficient values are 0.521, 0.643, 0.636, and the correlation coefficient values are all greater than 0, which means among TPB to purchase intentions, government policies to purchase intentions, and perceived value to purchase intentions, there are positive correlations.

4.4.2 Variable correlation analysis results

Table 12 shows the correlation analysis performed on each variable in the model. First weighted average of all items of nine variables in the model, consumer attitudes, subjective norms, perceived behavioral control, purchase intentions, price value, quality value, service value, functional value, and government policies. Correlation analysis of the data results are shown in table 12:

Table 12 Variable correlation analysis results (own elaboration)

Variables	Correlation with purchase intentions
Attitudes	0.462**
Subjective norms	0.563**
Perceived behaviour control	0.511**
Price value	0.575**
Quality value	0.450**
Service value	0.514**
Function value	0.492**
Government policies	0.521**
Purchase intentions	1

* $p < 0.05$ ** $p < 0.01$

It can be concluded from the above table that the correlation coefficient between purchase intentions and attitudes is 0.462, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and attitudes. The correlation coefficient between purchase intentions and subjective norms is 0.563, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and the subjective norms. The correlation coefficient between purchase intentions and perceived behavioral control was 0.511, and it was significant at the 0.01 level, indicating that there was a significant positive correlation between purchase intention and perceived behavioral control. The correlation coefficient between purchase intentions and price value is 0.575, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and price value. The correlation coefficient between purchase intentions and quality value is 0.450, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and quality value. The correlation coefficient between purchase intentions and function value is 0.492, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and function value. The correlation

coefficient between purchase intentions and service value is 0.514, and it is significant at the 0.01 level, indicating that there is a significant positive correlation between purchase intentions and service value. The correlation coefficient between purchase intentions and government policies is 0.521, and it is significant at the 0.01 level, thus indicating that there is a significant positive correlation between purchase intentions and government policies.

Surprisingly, it was found that most of the respondents' incomes were higher than 200,000, but in the purchase intention of new energy vehicles, the price factor is still the primary factor considered by potential consumers. The second is the subjective norm. In the context of Chinese society and culture, the opinions of relatives or friends around them are relatively important.

4.5 Regression analysis

4.5.1 Linear regression of TPB

This paper takes the gender, age, marital status, educational background, income, and occupations of the respondents as control variables and conducts hypothesis analysis and verification based on the three dimensions of the consumer's planned behavior theory. Due to the limited space of the table, only the linear regression analysis of the main variables, in table 13, the relationship between attitudes, subjective norms, and consumer purchase intentions is obtained:

Table 13 Linear regression analysis results of planned behavior and purchase intentions (own elaboration)

	Unstandardized Coefficients		Standardized Coefficients	t	p	VIF	R ²	Adjusted R ²	F
	B	Std. Error	Beta						
constant	0.000	0.042	-	0.000	1.000	-	0.422	0.417	F (8316) =78.129, p=0.000
ATT	0.223	0.049	0.223	4.558	0.000*	1.330			
SN	0.371	0.050	0.371	7.408	0.000*	1.392			

PBC	0.215	0.053	0.215	4.064	0.000*	1.558
<i>Dependent variable: purchase intentions</i>						
<i>D-W value : 1.875</i>						
<i>* p<0.05 ** p<0.01</i>						
<i>N=325</i>						

As can be seen from the above table, take the attitudes, subjective norms, and perceived behavioral control as independent variables, and purchase intentions as the dependent variable for linear regression analysis. It can be seen from the above table that the model R-square value is 0.422, which means attitudes, subjective norms, and perceived behavioral control can explain 42.2% of the changes in purchase intentions. When the F-test was performed on the model, the model passed the F-test (F=77.879, p=0.000<0.05), which means that at least one attitudes, subjective norms, and perceived behavioral control have an impact on purchase intentions. In addition, for the model the multicollinearity test of the model shows that the VIF values in the model are all less than 5, which means that there is no collinearity problem; and the D-W value is near the number 2, which means that the model does not have autocorrelation, and there is no correlation between sample data.

According to the content of table 13, the final specific analysis shows that:

The regression coefficient value of attitudes is 0.223 (t=4.607, p=0.000<0.01), which means that attitudes have a significant positive impact on purchase intentions. The regression coefficient value of the subjective norms is 0.371 (t=7.388, p=0.000<0.01), which means that the subjective norms will have a significant positive impact on purchase intentions. The regression coefficient value of perceived behavioral control was 0.215 (t=4.042, p=0.000<0.01), which meant that perceived behavioral control had a significant positive impact on purchase intentions.

The summary analysis shows that attitudes, subjective norms, and perceived behavioral control all have a significant positive impact on purchase intentions. So, H1a, H1b, and H1c are supported.

4.5.2 Hierarchical regression between TPB and government policies

1) Hierarchical regression

After performing a linear regression analysis on the three independent variables of planned behavior, I introduced government policies among them and carried out a hierarchical regression analysis on the relationship between the theory of planned behavior and government policies. Hierarchical regression is used to study independent variables model changes that come with adding. First, for the analysis of government policies, TPB, and purchase intentions, the hierarchical regression method is used as the method of effect test. I centralized the independent variables in the paper, namely, perceived value and attitudes, subjective norms, and perceived behavioral control, the purpose of the centralization of the three variables is to reduce the multicollinearity of the regression equation variables, and then perform hierarchical regression analysis, the content of table 14 shows the summarized the specific steps and indicators of the influence of government policies on attitudes and purchase intentions.

Table 14 Hierarchical regression analysis results related to government policies (own elaboration)

	Model 1					Model 2				
	B	std. erro	t	p	β	B	std. erro	t	p	β
constant	0.000	0.042	0.000	1.000	-	-0.000	0.041	-0.000	1.000	-
ATT	0.223**	0.049	4.558	0.000	0.223	0.185**	0.049	3.783	0	0.185
SN	0.371**	0.050	7.408	0.000	0.371	0.308**	0.052	5.966	0	0.308
PBC	0.215**	0.053	4.064	0.000	0.215	0.163**	0.054	3.042	0.003	0.163
GP						0.204**	0.052	3.922	0	0.204
R²	0.422					0.449				
Adjust R²	0.417					0.442				
F value	<i>F</i> (3321) =77.129, <i>p</i> =0.000					<i>F</i> (4320) =65.066, <i>p</i> =0.000				
ΔR^2	0.422					0.027				
ΔF value	<i>F</i> (3321) =77.897, <i>p</i> =0.000					<i>F</i> (1320) =15.379, <i>p</i> =0.000				
<i>Dependent variable: purchase intentions</i>										
<i>N=325</i>										

From the above table, this hierarchical regression analysis involves a total of 2 models. The independent variables in model 1 are attitudes, subjective norms, perceived

behavioral control, model 2 adds government policies based on model 1, and the dependent variable of the model is purchase intentions.

From the summary analysis in table 14, we can see those attitudes, subjective norms, and perceived behavioral control all have a significant positive impact on purchase intentions.

Therefore, for model 2, after adding the government policies based on model 1, the change of the F value shows significant ($p < 0.05$), which means that the government policies have explanatory significance for the model. In addition, the R-square value increased from 0.422 to 0.449, which proves that the government policies have a 2.7% explanation for purchase intention. Specifically, the regression coefficient value B of government policies is 0.240, and it is significant ($t = 3.922$, $p = 0.000 < 0.01$), which means that government policies have a significant positive impact on purchase intentions.

Therefore, it can be concluded that the implementation of government policies is well-founded and that government policies can robustly promote NEV consumption.

Therefore, H2 is supported, we next examine the mediating effect of government policies on TPB and purchase intentions.

2) Mediating effect

To verify the mediating effect of government policies between planning behavior and purchase intentions, I further used the mediation moderation analysis item of SPSS and obtained the analysis results in table 15 below.

Table 15 Analysis of the mediating effect of government policies (own elaboration)

	PI (model 1)					GP (model 3)					PI (model 2)				
	B	std. error	t	p	β	B	std. error	t	p	β	B	std. error	t	P	β
constant	0.000	0.042	0.000	1.000	-	0.000	0.044	0	1.000	-	0.000	0.041	0.000	1.000	-
ATT	0.223**	0.049	4.558	0.000	0.223	0.187**	0.051	3.647	0	0.187	0.185**	0.049	3.783	0	0.185
SN	0.371**	0.050	7.408	0.000	0.371	0.309**	0.052	5.897	0	0.309	0.308**	0.050	5.966	0	0.308
PBC	0.215**	0.053	4.064	0.000	0.215	0.257**	0.055	4.625	0	0.257	0.163**	0.054	3.042	0.000	0.163
GP											0.204	0.052	3.922	0	0.204
R ²	0.422					0.366					0.449				
Adjusted R ²	0.417					0.360					0.442				
F value	F (3321) =78.129, p=0.000					F (3321) =61.749, p=0.000					F (4320) =65.066, p=0.000				

Dependent variable: purchase intentions
N=325

The mediation effect analysis involves a total of 3 models:

Model 1: Regression Analysis of Independent and Dependent Variables

Model 2: Regression Analysis of Independent, Mediator and Dependent Variables

Model 3: Regression Analysis of Independent and Mediating Variables

The difference between model 1 and model 2 is that model 2 adds mediator variables to model 1, so the two models from model 1 to model 2 should use hierarchical regression analysis (the first layer puts attitudes, subjective norms, perception behavior control, the second layer is put into government policy), which are as follows:

purchase intentions = 0.000 + 0.223 * attitudes + 0.371 * subjective norms + 0.215 * perceived behavioral control

government policy = 0.000 + 0.187 * attitudes + 0.309 * subjective norms + 0.257 * perceived behavioral control

purchase intentions = -0.000 + 0.185* attitudes + 0.308* subjective norms + 0.163* perceived behavioral control + 0.204* government policy

The results are calculated according to the formula and summarized in table 16.

Table 16 Summary results of the mediating effect size of government policies (own elaboration)

Item	Test results	c	a	b	a*b	c'	Effect ratio calculation formula	Effect ratio
		total effect			mediating effect	direct effect		
ATT=>GP=>PI	Partial mediation	0.223	0.187**	0.204**	0.038	0.185		17.137%
SN=>GP=>PI	Partial mediation	0.371	0.309**	0.204**	0.063	0.308	a*b/c	17.047%
PBC=>GP=>PI	Partial mediation	0.215	0.257**	0.204**	0.052	0.163		24.370%

According to the indicators in table 16, with government policies as the mediating variable, c' represents the direct effect of the regression coefficient of the independent variable on the dependent variable (when there is an intermediary variable M in the model), therefore the regression coefficients c' of attitude, subjective norms, and perceived control behavior on purchase intentions are 0.185, 0.308 and 0.163, respectively. A represents the regression coefficient of the independent variable to the mediator variable, which means regression coefficient a of attitudes, subjective norms, and perception control behavior to purchase intentions are 0.187**, 0.309** and 0.257** respectively, which are judged to be significant, that is attitudes, subjective norms and perceived behavioral control have significant effect to government policies. The regression coefficients b of government policies to purchase intentions are all 0.204**, b represents the regression coefficient of the mediator variable to the dependent variable, which means the mediator variable of government policies is significant to purchase intentions. Attitudes, subjective norms, and perceived control behaviors are multiplied by government policies respectively, and the product is the mediation effect a*b, which represents mediator effect, which are 0.038, 0.063, and 0.052 respectively, means the mediating effect of government policies between attitudes, subjective norms, perceived behavioral control and purchase intentions is significant, and the regression coefficients

a*b and c' are both positive, so the conclusion is drawn, government policies play a partial mediating role in planning behavior and purchase intentions. Among them, it is surprising to find that government policies have the strongest mediating influence on subjective norms and purchase intentions. This also shows that in the context of China's environment, the Chinese government is very powerful. The word of mouth will have a great impact on the consumption of goods. Therefore H2a, H2b, and H2c are supported.

4.5.3 Hierarchical regression between TPB and perceived value

1) Hierarchical regression

After performing a linear regression analysis on the three independent variables of planned behavior, I introduced perceived value among them and conducted a hierarchical regression analysis on the relationship between planned behavior, perceived value, and purchase intentions. First, for the analysis of perceived value on planned behavior and purchase intentions, the hierarchical regression method is used as the method of effect test. The centralization of variables is carried out because perceived value has four dimensions, I averaged the four dimensions together, therefore perceived value is shown up in the tables as one variable. And then the three variables of perceived value and attitudes, subjective norms. The relationship between planned behavior, perceived value, and purchase intentions is obtained in table 17 below.

Table 17 Hierarchical regression analysis results related to perceived value (own elaboration)

	Model 1					Model 2				
constant	B	std. erro	t	p	β	B	std. erro	t	p	β
constant	0.000	0.042	0.000	1.000	-	-0.000	0.040	-0.000	0	-
ATT	0.223**	0.049	4.558	0.000	0.223	0.178**	0.047	0	0.001	0.178
SN	0.371**	0.050	7.408	0.000	0.371	0.219**	0.053	0	0.012	0.219
PBC	0.215**	0.053	4.064	0.000	0.215	0.104**	0.053	0.050	0.357	0.104
PV						0.444**	0.069	0	0.000	0.363
R ²	0.422					0.489				
Adjust R ²	0.417					0.483				
F value	F (3321) =77.129, p=0.000					F (4320) =76.557, p=0.000				
ΔR ²	0.422					0.067				
ΔF value	F (3321) =78.129, p=0.000					F (1320) =41.945, p=0.000				

As can be seen from the above table, this hierarchical regression analysis involves a total of 2 models. The independent variables in model 1 are attitudes, subjective norms, and perceived behavioral control, and model 2 adds a perceived value based on model 1, and the dependent variable of the model is purchase intentions.

From the summary analysis in table 15, we can see those attitudes, subjective norms, and perceived behavioral control all have a significant positive impact on purchase intentions.

Therefore, I mainly analyze model 2 after adding the perceived value to model 1, the change in the F value is significant ($p < 0.05$), which means that the addition of the perceived value has explanatory significance to the model. In addition, the R-square value increased from 0.422 to 0.489, which proves that the fitting is in good condition, and the perceived value can have a 15.0% explanation for purchase intentions.

Specifically, the regression coefficient value B of the perceived value is 0.444, and it is significant ($t = 10.612$, $p = 0.000 < 0.01$), which means that the perceived value has a significant positive impact on purchase intentions.

Therefore, perceived value has a positive impact on planned behavior to purchase intentions, hypothesis H3 is supported. Next, we examine the mediating effect of perceived behavior on planned behavior and purchase intentions. As can be guessed, perceived value plays a significant role in influencing purchasing behavior, because value, quality, service, etc. in perceived value are all factors that most consumers value and are the most important factors for the survival of goods and enterprises. reason.

2) Mediating effect

To verify the mediating effect of perceived behavior between planned behavior and purchase intentions, the mediation adjustment analysis item of SPSS was further used, Like the steps mentioned above, Model 3 is changed from government policy to perceived value. And the rest procedure stays the same. The mediation effect analysis involves a total of 3 models, which are as follows:

$\text{purchase intentions} = 0.000 + 0.223 * \text{attitudes} + 0.371 * \text{subjective norms} + 0.215 * \text{perceived behavioral control}$

perceived value=0.000+0.101*attitudes+0.342*subjective norms+0.251*perceived behavioral control

purchase intentions=-0.000+0.178*attitudes+0.219*subjective norms+0.104*perceived behavioral control+0.444*perceived value

and the analysis results in table 18 were obtained:

Table 18 Analysis of the mediating effect of perceived value (own elaboration)

	PI (model 1)					PV (model 3)					PI (model 2)				
	B	std. error	t	p	β	B	std. error	t	p	β	B	std. error	t	P	β
constant	0.000	0.042	0.000	1.000	-	0.000	0.032	0.000	1.000	-	0.000	0.040	0.000	0	-
ATT	0.223**	0.049	4.558	0.000	0.223	0.101**	0.037	2.706	0.000	0.124	0.178**	0.047	0	0.001	0.178
SN	0.371**	0.050	7.408	0.000	0.371	0.342**	0.038	8.910	0.000	0.419	0.219**	0.053	0	0.001	0.219
PBC	0.215**	0.053	4.064	0.000	0.215	0.251**	0.041	6.179	0.000	0.307	0.104	0.053	0.050	0.357	0.104
PV											0.444**	0.069	0.000	0.000	0.363
R ²	0.422					0.491					0.489				
Adjusted R ²	0.417					0.486					0.483				
F value	F (3321) =77.129, p=0.000					F (4320) =76.557, p=0.000					F (4320) =76.557, p=0.000				

Dependent variable: purchase intentions
N=325

According to the formula of mediation analysis, the analysis results in table 19 are obtained:

Table 19 Summary results of the mediating effect size of perceived value (own elaboration)

Item	Test results	c	a	b	a*b	c'	Effect ratio calculation formula	Effect ratio
		total effect			mediating effect	direct effect		
ATT=>PV=>PI	Partial mediation	0.223	0.101**	0.444**	0.045	0.178	a*b/c	20.213%
SN=>PV=>PI	Partial mediation	0.371	0.342**	0.444**	0.152	0.219		40.944%
PBC=>PV=>PI	Partial mediated	0.215	0.251**	0.444**	0.111	0.104	-	51.758%

According to the indicators in table 19, with perceived value as the mediating variable, the direct effect c' of attitudes, subjective norms and perceived behavioral control on purchase intentions are 0.178, 0.219 and 0.104, respectively. A represents the regression coefficient of the independent variable to the mediating variable, therefore, the regression coefficient value a of attitudes, subjective norms and perceived behavioral control to perceived value are 0.101**, 0.342** and 0.251** respectively, which are judged to be significant, represents that attitudes, subjective norms and perceived behavioral control have significant effect to perceived value, and the regression coefficients b of perceived value to purchase intentions are all 0.444**, so the perceived value has significant effect to purchase intentions. Attitudes, subjective norms, and perceived control behaviors are multiplied by perceived value, respectively, which is the mediation effect a*b, which are 0.045, 0.152 and 0.111 respectively, represents the mediation effect between attitudes, subjective norms, perceived behavioral control and purchase intentions is significant; and the regression coefficients a*b and c' are both positive. Therefore, perceived value partially mediates attitudes to purchase intentions, and perceived value partially mediates subjective norms to purchase intentions, perceived value partially mediates perceived behavioral control to purchase intentions, hypothesis H3a, H3b, H3c are all supported. Based above analysis, it can be concluded:

Variables	Hypothetical description	Results
H1	H1: Consumer planned behavioral theory has an impact on purchase intentions;	support
	H1a: Consumers' attitudes have a positive impact on purchase intentions;	support

	H1b: Consumers' subjective norms have a positive impact on purchase intentions;	support
	H1c: Consumers' perceived behavioral control has a positive impact on purchase intentions;	support
H2	H2: Government policies guidance has a positive impact on the relationship between consumers' planned behavior and purchase intentions;	support
	H2a: Government policies play a partial mediating role in the relationship between consumers' attitudes and purchase intentions;	support
	H2b: Government policies play a partial mediating role between consumers' subjective norms and purchase intentions;	support
	H2c: Government policies play a partial mediating role between consumers' perceived behavioral control and purchase intentions.	support
H3	H3: Perceived value plays an influential role in the relationship between planned behavior and purchase intentions;	support
	H3a: Perceived value plays a partial mediating role between consumers' attitudes and purchase intentions;	support
	H3b: Perceived value plays a partial mediating role between consumers' subjective norms and purchase intentions;	support
	H3c: Perceived value plays a partial mediating role between consumers' perceived behavioral control and purchase intentions;	support

Table 20 Summary of Hypothesis Test Results (own elaboration)

Chapter 5 Conclusion and prospect

5.1 Conclusion

This paper takes the purchase intentions of new energy vehicle consumers as the empirical research object, based on the theory of planned behavior, to explore the influence of two dimensions of customer perceived value and government policies on the relationship between planned behavior theory and purchase intentions. Based on summarizing a large number of literature theories, reviewing from the measurement questions of Maloney, Park, Wang Yuehui, et al. (Maloney and Ward, 1973) (Park and Lessig, 1977), Wang Yuehui (Wang and Wang, 2013), and Sweeney & Soutar's customer-perceived value model (Sweeney and Soutar, 2001), Brady & Cronin Service Quality Rating Model (Brady and Cronin, 2001), Nan Xiaoli (Nan, 2005), Wang Dalin (Wang, 2011), Yang Jie (Yang, 2012) and other scholars. This article is based on the research of many scholars, combined with the current industrial policy model of the new energy vehicle consumption market in Suzhou, hypotheses are proposed and a model suitable for this paper is designed. Then, taking Suzhou City as the survey area, a questionnaire was distributed, and 325 valid data were collected. Reliability, validity, regression analysis, mediation analysis, and hypothesis testing were carried out on them, and the following conclusions were drawn:

1) The relationship between TPB and purchase intentions

The theory of consumer planned behavior has three dimensions, attitudes, subjective norms, and perceived behavioral control, which all have a positive impact on consumers' purchase intentions respectively. Regarding the influence of purchase intentions, I use the standardized coefficient beta as the main judgment basis. The value of subjective norms is 0.371, which has the greatest influence on purchase intention, consumers' perceived behavioral control has the value of 0.223, and the value of attitudes is 0.215, the influence of attitudes to consumers' purchase intentions is more limited than the other two.

Hypothesis H1 is supported, consumer planned behavioral theory has an impact on purchase intentions. Under the increasingly bad environment in China, the attitudes formed by individuals in the face of shortage of ecological resources and serious environmental pollution can prompt individuals to change their consumption behavior. The advocacy of new energy vehicles and the constant reminding of environmental

protection can bring the individual has a sense of crisis in the ecological environment, and then the individual pays more attention to the impact of individual behavior on the society, a strong green environmental attitude is formed, and therefore impact the purchase intentions.

2) The relationship between government policies, TPB, and purchase intentions Combined with the above analysis, government policies, consumers' planned behavior, and purchase intentions have a positive impact, but compared with perceived value, government policies have less impact on purchase intentions. The current Suzhou government policies focus on the price and quality experienced by consumers. The policy vigorously develops and publicizes the environmental protection society, and the promotion of new energy vehicles has strengthened consumers' trust. In addition, combined with the Chinese background, government policies usually have a relatively high level of confidence. Strong credibility, consumers have strong subjective norms, and consumers tend to share among each other, so the role of government policies on subjective norms, compared with the other two variables, has a greater impact. In addition, government policies play a partial mediating role between planned behavior theory and purchase intentions. Combined with the analysis of the mediating effect of government policy in Chapter 4, it can be concluded that the mediating variable government policy plays mediating role between the independent variable attitudes, subjective norm, perceived behavioral control and dependent variable purchase intentions. Indicating that in addition to attitudes, subjective norms and perceived behavioral control, there are also government policies factor that affecting purchase intentions, and attitudes, subjective norm and perceived behavioral control have effect to purchase intentions partly through government policies.

What's more, since government policy plays an intermediary role between planning behavior and new energy vehicle purchase intention. Personal norms also have a positive impact on the willingness to purchase new energy vehicles. According to the previous regression analysis, it is not difficult to conclude that for Chinese residents, the internalized awareness of norms is strong. If government policies can make the whole society gradually improves environmental protection quality and pro-environmental behavior constraints, strengthening internalized behavioral norms for consumers will increase the probability of purchasing new energy vehicles; at the same time, in such a social environment, the guiding role of consumers' environmental values is also very

important, and the policies have also the functions to guide consumers' altruistic values. The leading role of behavior and ecological values, enhance the personal norms of pro-environment, and at the same time, also greatly enhance the willingness to purchase new energy vehicles.

3) The relationship of perceived value, TPB, and consumer purchase intentions
The product features, quality, and functions of new energy vehicles are all aspects that consumers attach great importance to in the process of purchasing new energy vehicles. From the regression results, the regression coefficient B of consumers' perceived value between planned behavior and consumer purchase intentions is 0.444, indicating that consumers' perceived value has a relatively important influence on purchase intentions. In the perceived value, the price, function, service, and quality of new energy vehicles are very important. Thus, we can conclude that with the improvement in the functions, quality, and service aspects of the new energy automobile enterprises, consumers can enjoy convenient, comfortable, and accurate services, which will improve their attitude towards products, and gradually increase customer satisfaction and loyalty, which will greatly stimulate consumers.

In addition, perceived value partially mediates the relationship between planned behavior theory and purchase intentions. Combined with the analysis of the mediating effect of perceived value in Chapter 4, it can be concluded that the mediating variable perceived value plays a mediating role among the independent variable attitudes, subjective norms, perceived behavioral control and the dependent variable purchase intentions. It shows that in addition to attitudes, subjective norms and perceived behavioral control, perceived value factors affect purchase intentions, and attitudes, subjective norms and perceived behavioral control affect purchase intentions through Perceived value. Perceived value has four dimensions, so it can be concluded that price, quality, function, and service partially mediate purchase intentions.

perceived value plays a mediating role between planning behavior and NEV purchase intention. When an individual has a strong attitude, perceived behavior control and subjective norm, that is, when he believes that the environment is closely related to his own life, it will increase the individual's green perceived value of new energy vehicles, and then their purchase intention will be stronger, which is also reflected from the side. When most residents in China are considering choosing an Xinneng vehicle, if they consider environmental protection and personal pro-environmental behavior motives,

starting from the orientation of environmental values will be very helpful for expanding the new energy vehicle market.

5.2 Research Implications

Combined with China's environmental problems and the policies and measures issued by the Suzhou Municipal Government, the growth of new energy vehicles among Suzhou residents is rapidly increasing. For the guidance of new energy vehicle consumption, strong government support and new energy vehicle companies are needed. As a substitution for traditional vehicles produced by improving environmental quality, new energy vehicle production should not only rely on policy support to promote sales but should also be tested by market consumers by strengthening its product quality and relying on the characteristics and advantages of products and services.

The study found that government policies and perceived value had a positive impact on the planned behavior of new energy vehicles on their purchase intentions. Therefore, both enterprises and the government should focus on improving the characteristics and quality of new energy vehicles. In terms of consumer psychology, enough trust should be given to customers, and provide subsidies and guidance in terms of policies. New energy vehicles are large-scale consumption, and the purchase cycle takes long time for consumers to understand and consider. Therefore, the publicity and guidance process for potential consumers should focus on long-term and sustainability, give consumers enough trust and provide high-quality services, so that consumers can have access to relevant information from different aspects, and companies can display and publicize the characteristics of new energy vehicles from different perspectives, improve consumer attitudes, and promote consumer behavior.

The new energy vehicle industry needs orderly planning and development, unified and standardized market management, and enhance overall professionalism and competitiveness of the industry. Support the continuous research and development of electronic technology, and the continuous replacement of core components such as batteries, and promote the industry to be more electrified, intelligent, and Internet-based. In municipal engineering, the government should also strengthen infrastructure construction, such as charging and swapping stations, charging parking spaces, etc., and plans to continue to support the installation of public charging piles with government subsidies. The battery swap mode can very well relieve consumers' anxiety and troubles

about charging needs, but it has higher technical requirements and is more difficult to apply universally between different models, which can encourage enterprises to research and develop key problems.

5.3 Research Recommendations

Based on the consumption behavior of new energy vehicles, this paper explores the relationship between customer perceived value and government policies to consumer behavior and purchase intentions. From the above analysis, it can be concluded that both government policies and consumer perceived value have an impact on consumer purchases behavior. Therefore, this paper will put forward countermeasures and suggestions to promote the purchase intentions of new energy vehicles from the three aspects of consumers, enterprises, and government.

5.3.1 Government aspect

1) Provide policy support for new energy vehicles

Government policies have a guiding effect on consumers' purchase intentions, government incentive policies can promote consumers' purchase of new energy vehicles. On the one hand, the government can help the development of the new energy industry by giving more financial support. What's more, the government should make full use of online media social platforms, newspapers, advertisements and promotional books, and other means to strengthen publicity efforts, popularize the basic information about new energy vehicles and their related advantages and future development prospects and emphasize their safety, environmental protection and health. , fashion concept, improve consumers' awareness of new energy vehicles, especially for the environmental protection of new energy vehicles to cultivate consumers' awareness of new energy vehicle consumption.

2) Increase capital investment in new energy vehicles

The Chinese government has invested a lot in both capital and policy. A report by a research institution pointed out that the Chinese government has invested more than 300 billion yuan in new energy vehicles(Cheng, 2022). However, the current subsidies are insufficient, and with the decline of government financial subsidies in recent years, the policy support for new energy has been reduced, so the impact on the promotion and consumption of new energy vehicles is limited. In this case, the central government

and local prefectures should cooperate to establish more complete, diverse, and effective policies and fiscal stimulus policies, based on a long-term perspective, timely change the subsidies for new energy vehicles, and give subsidies to consumers, directly reduce the purchase price of consumers, instead of providing subsidies to auto companies; improve the financial service system, and innovate the loan, repayment, and insurance models of new energy vehicles, so that consumers can see the real-life from a series of industrial policies. The existence of interests, thereby enhancing the favourability and forming a positive and stable consumption attitude.

3) Strengthen the construction of infrastructure

The battery life of new energy vehicles is limited, so charging piles and charging stations are important factors for the sustainable consumption of new energy vehicles. At present, the infrastructure is only relatively complete in big cities in China. However, the infrastructure in the whole country is not perfect. The government must allocate more funds to build charging facilities so that the charging pile facilities are sufficient, the coverage is wide, and the use is convenient. In addition, it is also necessary for the government to further strengthen supervision, build infrastructure that meets the requirements, ensure safety and convenience, standardize the construction of charging piles, and improve utilization.

With the weakening of the subsidy policy, the construction of supporting facilities has become a more important factor. On the one hand, new energy vehicles need to rely on charging and battery life. Factors such as whether the current charging pile facilities are sufficient, have a wide coverage, and whether they are convenient to use may inhibit consumers' willingness to purchase. The government needs to safeguard and protect the rights and interests of consumers in terms of laws and regulations. Relevant departments should further strengthen supervision and check whether the infrastructure of charging facilities meets the requirements to ensure safety and comfort. If the requirements are not met, please order a solution immediately. At the same time, government departments should actively integrate domestic new energy vehicle charging stations, standardize charging stations, and improve the utilization rate of charging piles.

On the other hand, in response to the recycling and scrapping of used batteries for electric vehicles in my country, government departments should actively explore and build a standard recycling system for used batteries to prevent the improper disposal of

used batteries from causing many negative impacts on the environment and social security. In addition, it is also recommended to give priority to setting up a battery rental station or swap station in a suitable traffic location on the street to improve the convenience and functional value of the use of new energy vehicles.

5.3.2 Enterprise aspect

Through the impact of perceived value on purchase intentions, we can fully realize that the attributes, quality, and price value of new energy vehicles are the most important factors that directly affect Chinese consumers' purchase intentions. Therefore, the following suggestions are made for consumers' perceived value.

1) Enhance technology

On the one hand, new energy vehicle manufacturers should focus on the core technology of new energy vehicles, strengthen their independent research and development capabilities, and on the other hand improve product quality and performance. Focus on solving problems such as lithium batteries, battery life, power battery recycling management, reducing consumption and worry about the technical risks of new energy vehicles, improving product quality and industrial upgrading, and innovating the power performance, appearance performance, and safety performance of new energy vehicles. Consumers provide the most comfortable and convenient services to enhance consumer trust.

2) Enhance customer perceived value and cultivate customer satisfaction

Research shows that automobile service, vehicle sales service, spare parts service, and after-sales service are the key factors affecting customer satisfaction. Enterprises should establish perfect and convenient pre-sale consultation and after-sale service channels for customers to solve the problems of service providers with few outlets, low service management efficiency, difficult contact for service personnel, and insufficient timely handling of daily maintenance, and maintenance, research, and testing of automobiles. Provide professional training to relevant staff, cultivate the professional level of practitioners, more accurately meet customer needs, improve the service quality of enterprises, and enhance consumers' trust.

3) Boost publicity

The advertisement of new energy vehicles is an indispensable information conveyor belt for new energy vehicle companies in the process of market expansion. Enterprises can

guide consumption concepts by strengthening advertising and publicity, and at the same time, they can enrich the ways for customers to obtain information, to facilitate consumers to understand the product performance of new energy vehicles and government policies subsidies. In addition, companies should clarify their brand positioning, understand consumer needs, find accurate target market positioning, and formulate marketing plans that meet consumer needs and improve consumer satisfaction.

5.3.3 Consumer aspect

Consumers should continuously improve their awareness of environmental protection, actively understand the current issues such as national resource shortage and environmental pollution, strengthen the concept of green consumption, enhance their sense of social responsibility, consciously restrain their behavior, pay attention to sustainable development, and give affirmation and support to the development of new energy vehicles, actively participate, accept new things with a broad mind, enhance the consumer experience, and timely feedback information, put forward suggestions for the rapid promotion of new energy vehicles, and promote their healthy development.

For attitudes, subjective norms, and perceived behavioral control, in the context of the Chinese environment, advocacy, and communication with potential consumers should be strengthened (e.g. television, online, and other forms of media and access to usage, community consultation, and knowledge dissemination method competitions), various forms of media communication and communication have strengthened the concept of environmental protection, and also made new energy vehicles and environmental protection concepts linked to each other, so their awareness of energy-saving and environmental protection has been deeply rooted in the hearts of the people.

Through the organization of special training and other methods, young people can have a more comprehensive and in-depth understanding of relevant content about new energy vehicles, especially on this basis, to learn more about environmental protection knowledge, and strengthen publicity in the circle of relatives and friends, the work circle, and other aspects Effect. Raise awareness of environmental protection among citizens of the whole society. Enhances word of mouth effect.

List the exhaust gas types and rear emission pollution indicators of fuel vehicles.

Disclosed to the public consumers about my country's resource shortage and

environmental pollution and compared the performance indicators and costs of some new energy vehicles (such as fuel vehicles). Consciously formulate their values and behaviors to restrain themselves in the case of shortage of resources and energy and environmental pollution, strengthen their will to buy new energy vehicles, gradually implement the concept of environmental protection and green consumption in both thought and action, and gradually promote Good environmental protection effect. This has stimulated the strong interest and willingness of consumers to purchase new energy vehicles. On the one hand, it also helps to enhance and enhance its sales in the new energy vehicle market. On the other hand, it can better promote the development of my country's new energy industry. Strengthen the implementation of China's environmental protection policies.

5.4 The research limitations

1) Limitations of the sample

In this paper, only one city is selected as the research area. The development level, overall planning, and culture of the city will interfere with the data, so the sample may lack a certain degree of representativeness. At the same time, due to the insufficient number of samples, it is difficult to fully understand the true attitudes of the respondents towards the consumption of new energy vehicles, which will directly affect the final factor analysis results and cause errors in the research results.

2) Limitations of variable definition

In this paper, three variables were proposed, and a relatively simple analysis model is constructed, based on theoretical models and research of many scholars' world widely. More variables need to be introduced in follow-up research in order to have a more comprehensive perspective. For example, as a new development, new energy vehicles may not be understood. Some people feel unfamiliar, with the risks arising from the purchase of electric vehicles, the spontaneous combustion of electric vehicles, and the failure of automatic driving. Subsequent research may be in-depth in terms of perceived risk.

3) Limitations of data analysis

325 people filled in the questionnaire. Currently, 12.75 million people are living in Suzhou. Therefore, the survey data is very limited, and only simple reliability, validity,

and regression analysis are carried out for variables. The research conclusions do not represent the majority people's opinions in Suzhou.

4) It's own limitations

Although I am a student of the management curriculum, I do not have enough work experience in the new energy vehicle industry, so my understanding and thinking about the new energy vehicle market is relatively not deep enough, and some of my views are subjective.

5) Limitations of theoretical basis

The theoretical framework of this paper is mainly the theory of planned behavior. On this basis, the customer perceived value and government policies are combined, and the focus is on the research on the formation mechanism of consumer purchasing behavior. But other factors were not included, so the conclusions drawn are limited.

5.5 Outlook

This paper still needs to carry out more in-depth research from the following aspects in the follow-up research.

1) The selection of observation items for influencing factors needs to be further optimized

The influencing factor observation items selected in this study were generated by summarizing the existing literature and theoretical basis, and the proposed influencing factors and models were verified by correlation analysis and regression equation model. However, with the continuous development of the times, more theoretical research and empirical tests are still needed to integrate the changes in consumer, industry, and policy situations, condense the observation items of dynamic influencing factors and synthesize more effective models.

2) The content of the questionnaire design is relatively simple

The questionnaire designed this time is only for the survey of new energy vehicle consumers. In the follow-up research, the key link groups in the industrial chain can be included, the research variables can be increased, and variables such as purchase cost and ecological benefit can be introduced into the research. Designing a questionnaire with an internal logical relationship, so that the results of the questionnaire can find different perspectives of individuals with different roles on the problem, which is conducive to the design of more competitive new energy vehicle products.

3) The sample size of the survey needs to be increased

The amount of data obtained in this paper is relatively small, resulting in certain limitations in the calculated results. More samples need to be collected in the later stage, and the rationality of the proposed model will be further verified by increasing the amount of data, to establish a universal new energy vehicle purchasing behavior model.

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Appendix

Questionnaire

A survey on the consumption of new energy vehicles in Suzhou City, Jiangsu Province

Dear Madam/Sir,

Thank you for taking the time to read this questionnaire. This is a questionnaire used for academic research by the master's Research Group of the School of Management, University of Venice, Italy, to understand the willingness of Suzhou residents to buy new energy vehicles. The valuable information you provide will be the key to the success of this research, please complete the following questionnaire. We promise to keep your information confidential and keep it safe. Thank you for your cooperation and support.

Relevant knowledge to form vehicles with advanced technical principles, new technologies and new structures. Existing new energy vehicles include hybrid vehicles, pure electric vehicles (BEV, including solar vehicles), fuel cell electric vehicles (FCEV), hydrogen engine vehicles, other new energy vehicles (such as high-efficiency energy storage, dimethyl ether) vehicles, etc. category product.

1. Your gender: [Multiple choice]

Male

Female

2. Your age: [Multiple choice]

Under 25 years old

26-30 years old

31-35 years old

36-45 years old

Over 45 years old

3. Your marital status: [Multiple choice]

- Married
- Unmarried

4. Your educational background: [Multiple choice]

- Below high school
- Secondary school
- College
- Undergraduate
- Master
- Doctor
- Other

5. The annual income of your family is: [Multiple Choice]

- Less than 50,000
- 5—100,000
- 10-200,000
- More than 200,000

6. Your occupation is: [fill in the blank]

Do you agree with the following: (tick \checkmark in front of the corresponding number, where 1=strongly disagree 2=disagree 3=not sure 4=agree 5=strongly agree)

I think new energy vehicles are satisfactory. [Multiple choice]

- 1
- 2
- 3

4

5

I think the development of new energy vehicles is our responsibility to the environment and the future. [Multiple choice]

1

2

3

4

5

Purchasing and using eco-friendly products is vital to protecting the environment. [Multiple choice]

1

2

3

4

5

I think new energy vehicle travel can help improve the environment. [Multiple choice]

1

2

3

4

5

There are many people around me who have bought new energy vehicles. [Multiple choice]

1

2

3

4

5

My family approves of my purchase of a new energy vehicle. [Multiple choice]

1

2

3

4

5

Many of my friends encouraged me to buy new energy vehicles. [Multiple choice]

1

2

3

4

5

People who have an influence on my behavior (family and friends) think I should buy an NEV. [Multiple choice]

1

2

3

4

5

I am financially able to buy a new energy vehicle. [Multiple choice]

1

2

3

4

5

The purchase of new energy vehicles mainly depends on my will, without interference or restrictions from others. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think it is more economical to buy new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

It is very convenient to buy new energy vehicles, and information can be obtained everywhere. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I understand the information (brand, product, price, performance, etc.) of new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

My next car will be a new energy vehicle. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

Compared with traditional cars, I prefer to give priority to new energy vehicles.
[Multiple choice]

- 1
- 2
- 3
- 4
- 5

I will recommend my friends to buy new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the price of new energy vehicles is within an acceptable range. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think it is very economical to use new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the post-maintenance maintenance of new energy vehicles is economical.

[Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the battery life of new energy vehicles can meet my basic driving mileage needs.

[Multiple choice]

- 1
- 2
- 3
- 4
- 5

I feel that the use of new energy vehicles is quiet and comfortable to drive. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the battery life of new energy vehicles is long. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think new energy vehicles have a high safety factor. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the staff of new energy vehicle companies should be friendly and provide quality service. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think new energy vehicles have a complete pre-sale and after-sale service system. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think new energy vehicles are more convenient to use than traditional vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the appearance of new energy vehicles is beautiful and fashionable. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think the internal operation of new energy vehicles is very intelligent. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

I think new energy vehicles can reduce environmental pollution and damage and improve the ecological environment. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

When buying a car, I will consider the government's policies such as car purchase subsidies and tax cuts for the purchase of new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

When buying new energy vehicles, I will consider the government's promotion of new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

When buying new energy vehicles, I will consider the government's construction of charging piles for new energy vehicles. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

When I buy a new energy vehicle, I will consider the parking fee reduction and exemption of the Suzhou government, and the policy of unlimited travel. [Multiple choice]

- 1
- 2
- 3
- 4
- 5

This is the end of this questionnaire. Thank you very much for taking the time out of your busy schedule to fill in this questionnaire. We apologize for any inconvenience caused.

If you would like to know about further research results, please leave your contact information.

Your e-mail: [fill in the blank]
