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Study on the Influencing Factors of Consumers' Purchase Behavior of New Energy Vehicles

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Abstract

Against the backdrop of the global implementation of carbon neutrality goals and the in-depth practice of China's green development philosophy, the new energy vehicle industry has become a core engine driving the high-quality development of China's economy. Although a series of industrial policies have propelled its market size to achieve leapfrog growth, consumers' purchase behavior remains the pivotal core variable that determines whether the industry can realize sustainable, healthy, and high-quality development. This paper systematically reviews relevant domestic and international research findings and analyzes the influencing mechanism of new energy vehicle purchase behavior in China from four dimensions: consumers' individual characteristics, core product attributes, policy support system, and social perception environment. The study reveals that: sound charging infrastructure and stable policy support are the core prerequisites for the growth of new energy vehicle consumption; the 25–35 age group has shown significantly higher attention to intelligent connected and high-level intelligent driving functions than to price factors; social media word-of-mouth and user community operation can effectively stimulate potential consumer demand; range anxiety and battery safety concerns remain the key pain points restricting the comprehensive popularization of the industry. This research can provide a reference basis for automobile enterprises to optimize market strategies and government departments to improve industrial policies.

Keywords

New Energy Vehicles; Purchase Behavior; Influencing Factors.

1. Introduction

Driven by both the global carbon neutrality goal and China's green development strategy, new energy vehicles (NEVs) have become the core carrier of low-carbon transformation in the transportation sector. Under the combined effect of policy support and technological progress, the market penetration of NEVs in China has increased rapidly from 5.7% in 2020 to 53.9% in 2025, and China's NEV ownership ranks first in the world [1]. However, with the rapid market growth, the differentiation of consumers' car purchase decisions has become increasingly prominent: young consumers in first- and second-tier cities have a strong willingness to pay for intelligent functions, while consumers in third- and fourth-tier cities are significantly restricted by insufficient charging infrastructure; some consumers purchase NEVs driven by environmental protection concepts, while a large number of consumers still hold a wait-and-see attitude due to concerns over cruising range and battery safety. This indicates that NEV

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purchase behavior is a complex outcome jointly affected by multiple factors, including individual characteristics, product attributes, policies, and social influences.

In existing studies, Li et al. (2024) verified the positive impact of intelligent cockpits and high-level intelligent driving on consumers' purchase intention [2]; Zhang et al. (2024) found that the consumption preference of Generation Z has shifted to technology experience attributes [3]; Wang et al. (2023) quantified the inhibitory effect of range anxiety and safety risks on purchase decision-making [4]. However, most existing studies focus on the independent effect of a single factor, and systematic analysis of the multi-factor synergistic mechanism remains insufficient.

Therefore, this paper combines literature research and case analysis to dissect the influencing mechanism of NEV purchase behavior in China from four core dimensions, aiming to provide theoretical support and practical reference for automakers to optimize product strategies and for the government to improve industrial supporting policies.

2. Analysis on Influencing Factors of NEV Purchase Behavior

2.1. Individual Characteristic Dimension

Individual characteristics of consumers are the underlying factors affecting car purchase preferences, mainly covering three core levels: age and income, urban hierarchy, and psychological cognition. Consumer groups with different characteristics show clear demand differentiation in car purchase needs.

2.1.1. Age and Income Characteristics

Consumers of different age groups have fundamentally different value perceptions of automobiles. Generation Z, aged 25–35, has an inherent acceptance of emerging technologies. They no longer simply define automobiles as means of transport, but regard them as personal third living space and mobile intelligent hub, so they are willing to pay a price premium for well-performing intelligent cockpits and advanced automatic driving functions [3]. In sharp contrast, consumers aged 45 and above pay more attention to the practical value and long-term operating cost of vehicles. Cruising range, daily operating cost, and maintenance convenience are the core basis for their decision-making.

For example, buyers under 30 years old account for more than 60% of Z7's total users, and the post-1995 group has become the absolute main consumer of this model, which directly confirms young groups' high recognition of intelligent configuration [5]. The entire Z7 line is equipped with 896-line LiDAR and Qiankun ADS 4.1 intelligent driving system, enabling full-scenario urban navigation on Autopilot (NOA) and automatic valet parking. Its pre-sale data show that more than 70% of consumers placed an order precisely for this top-level intelligent driving hardware [5]. In response to young users' willingness to pay for high-end configurations, many brands have launched the product strategy of "full configuration for entry-level models," which greatly reduces consumers' choice threshold and decision-making cost. On the whole, the demand shift of young consumer groups is restructuring the competition logic of the NEV market. Automakers can no longer rely solely on low-price strategies to gain market share and must deepen intelligent technology innovation and user experience upgrading to build differentiated competitive advantages.

2.1.2. Urban Hierarchy Difference

The NEV market in first-tier cities is more mature, with core driving forces being strict license control and a complete charging infrastructure. 2024 data show that the penetration rate of NEVs in license-restricted cities such as Shanghai and Beijing reaches 58%-68%, far higher than 18%-28% in third- and fourth-tier cities [6]. Third- and fourth-tier cities and remote areas face problems of uneven charging facility distribution and a high vehicle-to-pile ratio (about 6.6:1), and insufficient charging convenience has become the primary constraint on local NEV

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consumption [7]. The "Hundred Counties, Thousand Stations, Ten Thousand Piles" pilot project launched in 2024 promoted the extension of charging networks to county-level regions. By June 2025, the county-level coverage of national charging facilities reached 97.08%, providing basic conditions for market sinking.

2.1.3. Psychological Cognitive Characteristics

Consumers' cognition of the "double carbon" goal and their risk perception of NEV technology directly affect purchase intention. Studies show that consumers with a clear understanding of the double carbon goal have a 42.3% higher NEV purchase intention than groups with vague cognition; while consumers with doubts about battery reliability have a 58.7% drop in purchase intention [8].

2.2. Product Attribute Dimension

Individual characteristics determine consumers' basic demand preferences, while the performance and configuration of the product itself are the core basis for consumers' final decision. Product attributes can be divided into basic functional attributes and differentiated competitive attributes, which jointly determine the core competitiveness of a product.

2.2.1. Basic Functional Attributes

Cruising range, charging efficiency, and battery safety are the core attributes of NEVs, which directly affect consumers' judgment of vehicle practicability.

In terms of cruising range: More than 80% of domestic consumers expect NEVs to have a cruising range of more than 400 km, and 20.1% of consumers say they will only consider purchasing when the range exceeds 1000 km [6]. The CLTC cruising range of the pure electric version of the Z7 reaches 905 km, and "qualified cruising range" became the core content of user praise within one month of launch [5]. Although the range of mainstream models has exceeded 600 km, test data from China Automotive Technology and Research Center (CATARC) [9] shows that the average range retention rate of pure electric models is only about 55% at -20℃, and low-temperature range attenuation is still a major concern for consumers.

In terms of charging efficiency: Z7 is equipped with 800V high-voltage fast charging technology, which can replenish 200 km of range in 5 minutes (CLTC condition). The brand has built a supercharging network in cooperation with State Grid, which effectively alleviates users' concerns about charging efficiency [5].

In terms of battery safety: The Giant Whale battery equipped on Z7 adopts a dual protection design of intelligent temperature control and structural protection and passes extreme environment tests from -30℃ to 60℃. Its range retention rate reaches 65% in the -20℃ ice and snow test, and the battery pack can still work normally after 48 hours of immersion [5]. In the pre-sale stage, the brand publicly released the battery safety test video, which effectively reduced users' concerns about battery safety. The Giant Whale 800V high-voltage battery platform is equipped with a cloud Battery Management System (BMS), which enables 7×24-hour battery status monitoring, analyzes data through AI technology, and warns of potential problems in time to ensure driving safety.

2.2.2. Differentiated Competitive Attributes

Intelligent connectivity and cockpit experience are core selling points that distinguish NEVs from traditional fuel vehicles, and are also the key to market competition. The intelligent cockpit of a certain model supports functions such as multi-device interconnection, continuous voice command, and seamless handover between the infotainment system and the mobile phone. Meanwhile, the whole line is equipped with 896-line dual-beam image-level LiDAR and Qiankun ADS 4.1 intelligent assisted driving system, which has higher-level automatic driving capability among peer models and is favored by young consumers. Relying on the intelligent cockpit ecosystem, it promotes the conversion of traditional fuel vehicle users to NEV users by

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virtue of smooth interaction and multi-device interconnection advantages. At present, an intelligent cockpit has become a core consideration for young consumers, and the penetration rate of models without intelligent cockpits among young groups is far lower than that of similar products equipped with this configuration.

2.3. Policy Environment Dimension

Policy is a key driving force for the early development of NEV market, and it functions from two aspects: reducing purchase cost and guaranteeing use experience.

2.3.1. Direct Incentive Policies

Policies such as purchase subsidies, purchase tax reduction and exemption, and license preference directly reduce consumers' purchase costs. Taking Shanghai as an example, NEVs can enjoy vehicle purchase tax exemption and free special license quota, and the aforementioned model also benefits from this policy as an NEV [10]. Meanwhile, the automaker cooperated with relevant enterprises to participate in the construction of community charging facilities in Shanghai and cooperated with local charging and swapping support policies to promote charging piles into communities. With the support of multiple policies, market demand in Shanghai is strong, and the pre-sale performance of the model is outstanding, with order share higher than the national average, which reflects the synergistic promotion effect of policy environment and infrastructure on NEV consumption.

2.3.2. Indirect Policies

Policies related to charging infrastructure construction and battery recycling systems affect consumers' perception of long-term use costs. The "Hundred Counties, Thousand Stations, Ten Thousand Piles" county-level charging and swapping infrastructure pilot project launched in 2024 [11] promoted the extension of charging networks to county-level regions. By June 2025, the county-level coverage of national charging facilities reached 97.08% [7], and the penetration rate of NEVs in third- and fourth-tier cities increased by 11.2 percentage points compared with 2023. Meanwhile, automakers have cooperated with Contemporary Amperex Technology Co., Limited (CATL) on battery technology and recycling systems, which improved car owners' confidence in long-term battery use and alleviated concerns about battery attenuation, reflecting the dual promotion effect of infrastructure improvement and technological innovation on NEV consumption. However, the construction progress of charging infrastructure is uneven across regions, and some county-level regions have problems such as "built but unused" charging piles and inadequate maintenance, which damage consumers' use experience.

2.4. Social Perception Dimension

The social environment affects consumers' car purchase decisions through information dissemination and group influence, and social word-of-mouth is the core influence carrier. During the pre-sale period of Z7, the brand launched the topic #Z7 Technology Aesthetics on platforms such as Douyin and Xiaohongshu, and invited technology bloggers to conduct actual tests on the intelligent driving system. The total playback of relevant content exceeded 500 million times, and the mention rate of "LiDAR" and "intelligent cockpit" in user discussions reached 76%, which strengthened consumers' recognition of the product's technological advantages [5].

Brand-built user communities can also produce strong word-of-mouth fission effects. The brand built an exclusive user operation system relying on its official APP and launched the "test drive for points" incentive activity during the launch of Z7, which successfully stimulated spontaneous communication among old users. Data shows that about 30% of pre-sale orders come from referrals by old users, and the conversion efficiency of acquaintance referrals is significantly higher than that of conventional marketing channels such as traditional

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advertising and offline stores. This result fully proves that group identity and circle influence at the social perception level can have a strong positive driving effect on consumers' final car purchase decision [5].

3. Conclusion

Against the background of the in-depth implementation of the global carbon neutrality strategy and the accelerated transformation of domestic green transportation, China's new energy vehicle (NEV) market has completed a critical transformation from a single policy-driven model to a two-wheel-driven model jointly driven by policy and market. Accordingly, the factors affecting consumers' vehicle purchase decisions have become more diverse and complex. Consumers' final vehicle purchase choice has never been determined by a single isolated factor, but a comprehensive result of the superposition and joint interaction of variables from multiple dimensions.

Based on the research and analysis in this paper, the following core conclusions can be drawn: First, sustained and stable policy support and full-coverage charging infrastructure are the fundamental guarantees for the healthy development of the NEV industry. Especially for third- and fourth-tier cities and the vast sinking county-level market, the construction progress and coverage density of public charging networks directly determine the release pace of local NEV consumption potential. Second, the comprehensive performance of the product itself has always been the core consideration for consumers' purchase decisions. Among them, cruising range, energy replenishment efficiency, and battery safety, the three basic indicators, are the core measures to eliminate consumers' purchase concerns; while technological configurations such as intelligent connectivity and high-level autonomous driving have become the core competitive tracks in the current NEV market, and their decision weight has surpassed the traditional price factor for young consumer groups. Third, differences in individual consumer characteristics have given rise to diversified market demands. Differences in age structure, city level, and environmental awareness jointly divide distinct consumer groups with different characteristics. Fourth, social media platforms and brand user communities have become important communication channels affecting consumers' purchase decisions, and positive word-of-mouth from real users can quickly improve product market recognition and brand favorability.

At present, the NEV industry is in a critical stage of technological innovation and market popularization. The conclusions of this paper can provide practical reference for automakers to clarify product R&D directions, balance basic performance and intelligent configurations, and accurately match the needs of different consumer groups, and also provide a theoretical basis for the government to improve charging infrastructure, optimize the policy system, and promote balanced market development. In the future, with the continuous upgrading of intelligent connectivity technology, the full coverage of charging supporting facilities, and the continuous maturity of consumer cognition, the influence mechanism of NEV purchase behavior will become more rational and diversified. Only when automakers adhere to technological innovation and user demand orientation, the government balances policy guidance and market regulation, and society creates a positive consumption environment, can we continue to solve consumption pain points, release market potential, promote the high-quality development of China's NEV industry, and help realize the carbon neutrality goal and low-carbon transformation of transportation.

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Table 1. Analysis Table of Key Factors for New Energy Vehicle Industry

First-level Dimension	Second-level Indicator	Indicator Interpretation
Policy and Infrastructure	Policy Support	Sustained and stable policy support is the fundamental guarantee for the healthy development of the NEV industry, providing long-term support for industrial development.
Policy and Infrastructure	Charging Infrastructure Coverage	The full coverage of charging infrastructure, especially in third- and fourth-tier cities and sinking county-level markets, the construction progress and coverage density of public charging networks directly determine the release pace of local NEV consumption potential.
Product Performance	Cruising Range	As one of the core considerations for consumers' purchase decisions, it is a basic indicator to eliminate purchase concerns and directly affects the convenience of vehicle use.
Product Performance	Energy Replenishment Efficiency	As one of the core considerations for consumers' purchase decisions, it is a basic indicator to eliminate purchase concerns and is related to charging speed and user experience.
Product Performance	Battery Safety	As one of the core considerations for consumers' purchase decisions, it is a basic indicator to eliminate purchase concerns, ensuring safe and reliable vehicle use.
Product Performance	Intelligent Connectivity	As a kind of technological configuration, it has become the core competitive track of the current NEV market. Its decision weight for young consumer groups exceeds the traditional price factor, and it improves the level of vehicle interconnection and intelligence.
Product Performance	High-level Autonomous Driving	As a kind of technological configuration, it has become the core competitive track of the current NEV market. Its decision weight for young consumer groups exceeds the traditional price factor, and it enhances driving assistance and automation functions.
Consumer Characteristics	Age Structure	As one of the individual differences of consumers, it divides different consumer groups together with city level and environmental awareness, giving birth to diversified market demand and affecting purchase preferences.
Consumer Characteristics	City Level	As one of the individual differences of consumers, it divides different consumer groups together with age structure and environmental awareness, giving birth to diversified market demand and reflecting regional consumption differences.
Consumer Characteristics	Degree of Environmental Awareness	As one of the individual differences of consumers, it divides different consumer groups together with age structure and city level, giving birth to diversified market demand and affecting green travel choices.
Communication Channels	Social Media Platforms	They are important communication channels affecting consumers' purchase decisions. Through positive word-of-mouth communication from real users, they can quickly improve product market recognition and brand influence.
Communication Channels	Brand User Communities	They are important communication channels affecting consumers' purchase decisions. Through positive word-of-mouth communication from real users, they can quickly improve brand favorability and user loyalty.

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