

Factors Influencing Consumers' Willingness to Purchase New Energy Vehicles in China: The Roles of Policy Incentives, Media Richness, and Consumer Perceptions

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Abstract

This study explores the mechanisms influencing consumers' willingness to purchase and adopt new energy vehicles (NEVs) in China, focusing on the roles of policy incentives, media richness, and consumer perceptions. The research adopts a quantitative approach, relying solely on questionnaire surveys and structural equation modeling (SEM). A total of 495 valid questionnaires were collected from consumers in Hunan Province, China, and analyzed using SPSS and Smart PLS software. The study reveals that government policy incentives, including production subsidies, purchase/use policies, and recycling policies, significantly impact consumers' perceived usefulness (economic benefits and respect for demand) and perceived ease of use (NEV performance and infrastructure) of NEVs. Media richness, categorized into low, medium, and high, plays a pivotal role in shaping consumer perceptions of NEVs' functional attributes, such as electrification (range, charging efficiency) and intelligent features (vehicle networking, autonomous driving). Quantitative analysis confirms that medium-richness media has the strongest positive impact on perceived functional attributes, while high-richness media is effective in conveying complex information about autonomous driving and vehicle networking. The study also highlights the moderating effects of brand familiarity and sense of control on the relationship between media richness and adoption intention. Specifically, brand familiarity weakens the impact of low and high-richness media on adoption intention, while internally controlled consumers are less influenced by high-richness media, and externally controlled consumers are more responsive to low and medium-richness media. Additionally, perceived usefulness, perceived ease of use, range and charging convenience, and functional attributes all have significant positive impacts on consumers' purchase intention.

Keywords: New Energy Vehicles; Policy Incentives; Media Richness; Consumer Perception; Purchase Intention; Structural Equation Modeling

Introduction

China's automobile industry is rapidly developing, but at the same time, the pressures of energy, environment, and safety are also increasing. Peaking carbon emissions has

become an increasingly challenging task, and new energy vehicles, due to their lower lifecycle carbon emissions compared to traditional fuel vehicles, will be a strategic approach to alleviate energy pressure, develop a green and low-carbon economy, and promote industrial transformation and upgrading. After years of industrial cultivation and development, China is currently at the forefront of global automotive electrification. The driving force for the development of the new energy vehicle industry has shifted from policy to the combination of policy and market, with integration and development accelerating with the information and communication industry, energy industry, and intelligent transportation industry, marking a new stage of high-quality development.

In this context, based on the incentive effects of new energy vehicle policies and the perspective of media richness, this study adopts the technology acceptance model theory, media richness theory, and control theory framework to explore the influencing factors and mechanisms of consumers' willingness to purchase and adopt new energy vehicles. Starting from policy incentives throughout the life cycle, media richness, and consumer attention, the research systematically examines how policies and media affect consumers' perceived usefulness (economic benefits and respect for demand) and perceived ease of use (NEV performance and infrastructure), and how media channels shape consumers' perceptions of electrification and intelligent functional attributes, thereby influencing purchase and adoption willingness. It also investigates the relationship between consumers' attention to NEV subsidy policies and sales volume, further expanding relevant research on the Chinese NEV market.

As the world's largest carbon emitter, China officially announced its energy-saving and emission reduction plan in 2015, promising to peak carbon emissions by 2030 or before and increase the proportion of non-fossil energy in primary energy consumption to around 20%. Against the backdrop of a new round of technological revolution and industrial transformation, the electrification, interconnection, and intelligence of automobiles have become the mainstream development trend. New energy vehicles are recognized as an effective strategy for addressing air pollution, mitigating climate change, and achieving carbon neutrality (Hong, 2019), with the shift to electricity in ground transportation being a key path to energy transition and carbon dioxide reduction for China's 2060 carbon neutrality goal (Zhang, 2021).

China has led global automotive electrification, ranking first in NEV sales for six consecutive years since 2015. In 2023, NEV production and sales reached 8.291 million and 8.273 million respectively, with year-on-year growth of 159.52% and 157.57%, accounting for 13.59% and 13.40% of total automobile production and sales. The sustained development of the automobile industry is closely linked to China's economic development level. With the continuous growth of per capita GDP, the number of civilian vehicles has increased significantly, reaching 336 million by the end of 2023, including 20.41 million NEVs. However, despite rapid market growth, there is still substantial room for improvement in market penetration. According to the "Energy Conservation and New Energy Vehicle Industry Development Plan (2021-2035)", NEV sales are expected to account for about 20% of new car sales by 2025. To achieve this goal, understanding the

factors influencing consumers' willingness to purchase and adopt NEVs is crucial. Previous studies have identified policy incentives, product attributes, and media information as key factors affecting consumer behavior (Ma et al., 2017; Sierzechula et al., 2014). However, there is a lack of systematic research on the combined effects of lifecycle policy incentives, media richness, and consumer perceptions on purchase intention. The NEV industry is characterized by immature technology, high R&D risks, and uncertain consumer demand (Huang, 2017), requiring strong government support. Governments worldwide have introduced various policy incentives, including production subsidies, purchase tax exemptions, and charging infrastructure support (Ghamami & Zockaie, 2016; Shi, 2022). Yet, despite strong policy backing, NEV market promotion in China faces obstacles such as high purchase costs, limited driving range, insufficient charging infrastructure, and consumer concerns about product performance (Zhao & Wang, 2021; Zhang, 2014).

In addition to policy and product factors, media information plays a vital role in consumer decision-making. With the development of information technology, consumers obtain NEV-related information through diverse channels such as newspapers, television, social media, and automotive websites. Different media channels have distinct information transmission characteristics, which may shape consumers' perceptions of NEV attributes differently (Daft & Lengel, 1987). However, existing studies have not clearly revealed how media richness affects consumers' perception of NEV functional attributes and subsequent purchase intention. Furthermore, previous research on policy incentives has mostly focused on single policy types (e.g., purchase subsidies) and lacked systematic analysis of combined lifecycle policies (production, purchase/use, recycling) (Wang & Hao, 2013), with the interaction mechanism between policy incentives, media richness, and consumer perceptions remaining unclear.

Therefore, this study addresses the following research questions: How do lifecycle policy combinations (production, purchase/use, recycling policies) affect consumers' perceived usefulness and perceived ease of use of NEVs, and thereby influence purchase intention? How does media richness (low, medium, high) shape consumers' perception of NEV functional attributes (electrification and intelligent features), and what is the moderating role of brand familiarity and sense of control? What are the combined effects of policy incentives, media richness, and consumer perceptions on consumers' willingness to purchase NEVs?

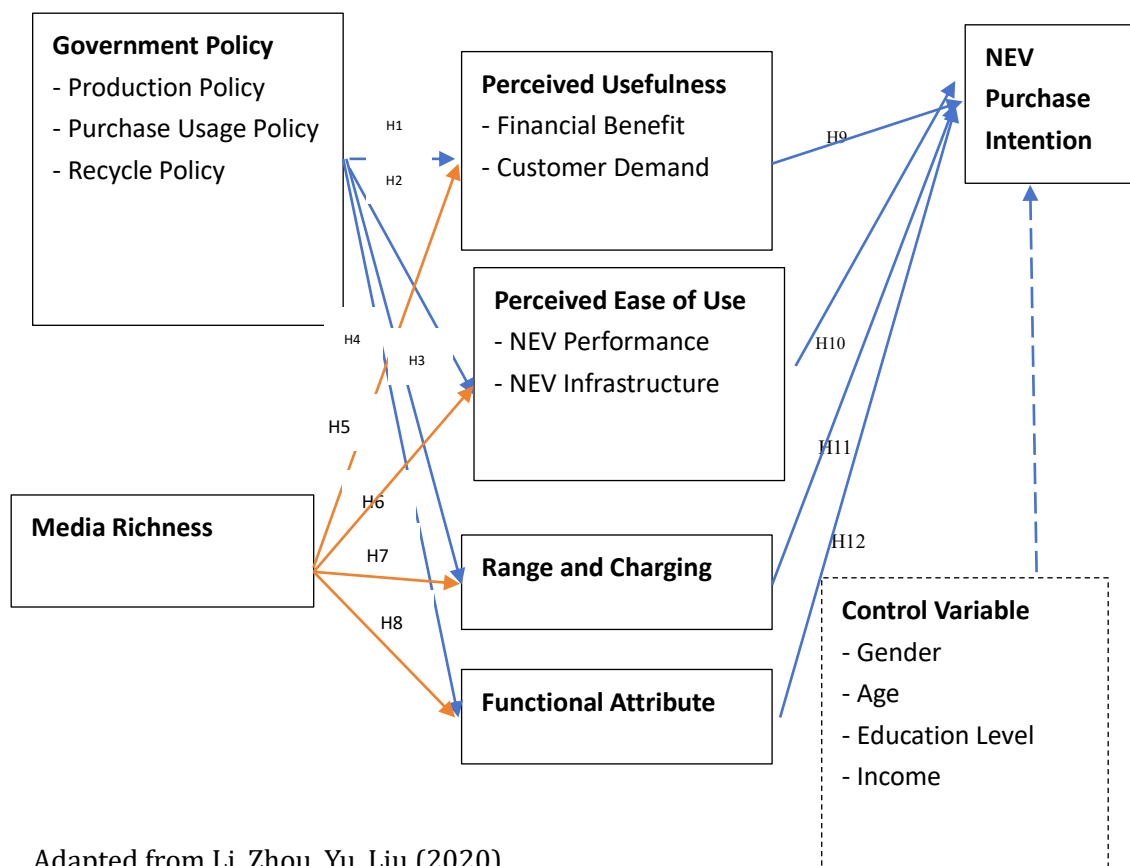
Based on these research questions, the main objectives of this study are: to explore the impact of lifecycle policy combinations on consumers' perceived usefulness (economic benefits, respect for demand) and perceived ease of use (NEV performance, infrastructure), verifying the mediating role of these perceptions; to analyze the influence of media richness on consumers' perception of NEV functional attributes (range, charging efficiency, vehicle networking, autonomous driving), examining the moderating effects of brand familiarity and sense of control; to construct and validate a comprehensive research model integrating policy incentives, media richness, consumer perceptions, and purchase intention; and to provide policy recommendations for the government, marketing

strategies for NEV manufacturers, and information dissemination suggestions for the media based on research findings.

Based on the Technology Acceptance Model (TAM), media richness theory, and sense of control theory, this study constructs a conceptual model of factors influencing consumers' willingness to purchase NEVs (Figure 1).

The model includes exogenous variables (lifecycle policy incentives, media richness), mediating variables (perceived usefulness, perceived ease of use, perceived functional attributes), moderating variables (brand familiarity, sense of control), and endogenous variables (purchase intention). Lifecycle policy incentives encompass production policies, purchase/use policies, and recycling policies. Perceived usefulness is divided into economic benefits and respect for demand, while perceived ease of use includes NEV performance and infrastructure. Perceived functional attributes consist of electrification attributes (range, charging efficiency) and intelligent attributes (vehicle networking, autonomous driving). The model assumes that lifecycle policy incentives affect purchase intention through perceived usefulness and perceived ease of use, while media richness influences purchase intention through perceived functional attributes, with brand familiarity and sense of control moderating the relationship between media richness and perceived functional attributes.

Figure Error! No text of specified style in document. Research model



Adapted from Li, Zhou, Yu, Liu (2020)

According to the research model, this study proposes 32 research hypotheses, covering relationships between government policy and perceived usefulness, perceived ease of use, range and charging, functional attributes; between media richness and these variables; and between perceived variables and NEV purchase intention. The research scope focuses on Chinese consumers aged 19-60, with a sample of 420 potential or existing NEV consumers who regularly pay attention to NEVs. The study measures eight constructs: production policies, purchase/use policies, recycling policies, economic benefits, respect for demand, NEV performance, infrastructure, and purchase intention, with control variables including occupation, household size, and number of household cars (Chen, 2019). All scales are adopted or adapted from previous literature, using multi-item evaluation and a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The research was conducted between August 2024 and November 2025.

Despite efforts to ensure rigor, this study has limitations. Firstly, questionnaire design and data processing may face challenges such as insufficient design skills leading to inaccurate responses, superficial information collection, and difficulty capturing complex phenomena. Secondly, while the study supplements intelligent functional attributes (vehicle networking, autonomous driving) to electrification attributes (range, charging efficiency), measuring and studying their specific impacts remains challenging. The research significance includes theoretical and practical aspects: theoretically, it extends policy incentive effectiveness research from a lifecycle perspective, expands media richness theory in NEV marketing, and supplements research on consumer attention impact; practically, it provides insights for government policy formulation, enterprise development strategy construction, and market promotion marketing basis.

Literature Review

Theoretical Basis

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was proposed by Davis (1989) based on the Theory of Reasoned Action (TRA) to explain and predict individuals' willingness to adopt new technologies. The model posits that adoption intention is determined by perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which an individual believes a specific technology will improve work or life efficiency, while perceived ease of use denotes the perceived effortlessness of using the technology (Davis, 1989). Venkatesh and Davis (1996) revised the original TAM, confirming that perceived usefulness and perceived ease of use directly impact technology adoption intention.

TAM has been widely applied in new product adoption research, such as mobile payment, e-commerce, and electric vehicles (Wang et al., 2017; Joachim et al., 2018). In the NEV context, perceived usefulness manifests in economic benefits, environmental protection, and social status, while perceived ease of use is associated with vehicle performance, charging convenience, and infrastructure (Schuitema et al., 2013; Liao et al., 2019). This study uses TAM as the core theoretical framework to explore how policy incentives influence consumers' perceived usefulness and perceived ease of use, and subsequently

their purchase intention.

Media Richness Theory

Media richness theory, proposed by Daft and Lengel (1986) based on information processing theory, refers to the ability of media to convey diverse information and reduce ambiguity. The theory classifies media by information transmission characteristics, including channel diversity, linguistic diversity, personalization, and timely feedback (Daft & Lengel, 1987). Low-richness media (e.g., newspapers, magazines) have single channels and limited interaction, while high-richness media (e.g., social media, video conferences) offer multiple channels and strong interactivity (Ishii et al., 2019).

Media richness theory argues that the match between media richness and task complexity affects information transmission efficiency. Simple, clear tasks can be addressed with low-richness media, while complex, ambiguous tasks require high-richness media (Daft & Lengel, 1987). In the NEV context, electrification attributes (range, charging efficiency) are relatively straightforward and can be transmitted through low or medium-richness media, while intelligent attributes (vehicle networking, autonomous driving) are more complex and require high-richness media to convey detailed information (Zhang et al., 2018; Yagci & Das, 2018). This study applies media richness theory to analyze how different media types influence consumers' perception of NEV functional attributes.

Sense of Control Theory

Sense of control theory, proposed by Rotter (1966) based on social learning theory, refers to the degree to which individuals believe their behavior can control event outcomes. Individuals with a high internal locus of control believe their actions and decisions influence events, while those with a high external locus of control attribute outcomes to external factors such as luck, fate, or others' behavior (Rotter, 1966).

Sense of control significantly impacts information processing and decision-making. Internally controlled individuals actively collect and analyze information, being less influenced by external sources, while externally controlled individuals are more susceptible to external information and opinions (Kanfer et al., 2017). In NEV purchase decisions, internally controlled consumers may rely on personal experience and judgment, while externally controlled consumers are more influenced by media information and policy incentives (Hohnemann et al., 2022). This study introduces sense of control as a moderating variable to explore its impact on the relationship between media richness and consumer perceptions.

Research on Policy Incentives and NEV Purchase Intention

Policy incentives are critical to NEV industry development. Previous studies show that government policies such as production subsidies, purchase tax exemptions, and charging infrastructure support significantly promote consumers' purchase intention (Ma et al., 2017; Sierzechula et al., 2014). For example, Ma et al. (2017) found a positive correlation between NEV market share and purchase subsidies, while Wu et al. (2022) noted that

tightening the dual credit policy imposes pressure on NEV manufacturers but drives technological innovation and industrial upgrading. In terms of policy types, production policies support manufacturers' R&D investment and technological innovation, improving product performance and reducing costs (Zhao & Yin, 2017). Purchase/use policies directly lower consumer purchase and usage costs (e.g., tax exemptions, free parking, road right preferences), stimulating demand (Yang & Hu, 2018). Recycling policies enhance NEVs' environmental friendliness and sustainability, boosting consumer trust and long-term market development (Assunção & Moura, 2016). However, existing research mostly focuses on single policy types, lacking systematic analysis of combined lifecycle policies (Wang & Hao, 2013). Additionally, policy impacts may vary by region and consumer characteristics (Helveston et al., 2015). This study analyzes the combined effects of production, purchase/use, and recycling policies on consumers' perceived usefulness, perceived ease of use, and purchase intention.

Research on Media Richness and NEV Purchase Intention

Media information plays a key role in consumer decision-making, helping consumers understand product attributes, policy incentives, and market trends (Fang & Zhen, 2023). Different media channels have distinct transmission characteristics, influencing consumers' perceptions and purchase intention differently. For example, television advertising conveys product images and brand information through sound and visuals, supporting brand promotion and emotional marketing (Zhang, 2022), while social media provides interactive, personalized information, facilitating real user experiences and recommendations (Vikas & Vikram, 2017). Media richness significantly impacts information transmission effectiveness. High-richness media conveys comprehensive, detailed information, aiding consumers' in-depth understanding of product attributes (Munnukka et al., 2019); Khan et al., 2025. For instance, Yagci and Das (2018) found that high-richness media contains rich experiential information and product knowledge, supporting purchase decisions. However, excessive information may cause overload, reducing decision-making efficiency (Lee & Borah, 2020; Damrongsiri et al., 2022).

In the NEV context, media richness may differently influence perceptions of various functional attributes. Electrification attributes (range, charging efficiency) are relatively intuitive and can be effectively transmitted through low or medium-richness media (Daft & Lengel, 1987; Channuwong et al., 2023), while intelligent attributes (vehicle networking, autonomous driving) are more complex and require high-richness media to convey detailed technical information and user experiences (Zhang et al., 2018). However, existing studies have not systematically explored how media richness influences consumers' perception of NEV functional attributes and subsequent purchase intention, a gap this study aims to fill.

Research on Consumer Perceptions and NEV Purchase Intention

Consumer perceptions of product attributes are important predictors of purchase intention. Previous studies show that perceived usefulness, perceived ease of use, and

perceived risk significantly impact NEV purchase willingness (Wang et al., 2017; Rezvani et al., 2015). Perceived usefulness includes economic benefits, environmental protection, and social status, while perceived ease of use relates to vehicle performance, charging convenience, and infrastructure (Schuitema et al., 2013; Liao et al., 2019).

In terms of product attributes, range and charging efficiency are key factors. Consumers care about whether NEVs meet daily travel needs and charging convenience (Skippon et al., 2016; Qian et al., 2019). Additionally, intelligent attributes such as vehicle networking and autonomous driving attract increasing attention, improving driving convenience, safety, and comfort, thereby enhancing purchase intention (Monios & Bergqvist, 2019; Rafael & Correia, 2020; Sutthadaanantaphokin et al., 2025).

However, consumers' perceptions of NEV attributes are often influenced by policy incentives, media information, and other factors (Egbue & Long, 2012; Wallis et al., 2013). For example, government subsidies reduce perceived purchase costs, while media reports improve awareness of product attributes. This study explores how policy incentives and media richness influence consumers' perceptions of NEV attributes and subsequent purchase intention.

Methodology

Research Design

This study adopts a quantitative research method, using questionnaire surveys to collect data and structural equation modeling (SEM) to test research hypotheses. The research process includes questionnaire design, pre-survey, formal survey, data analysis, and hypothesis testing.

Questionnaire Design

The questionnaire consists of two parts: basic information and measurement items. Basic information includes gender, age, education level, monthly income, occupation, family size, and number of household cars. Measurement items are designed based on existing literature and adjusted to the research context, covering the following variables:

- 1) Lifecycle policy incentives: Production policies, purchase/use policies, and recycling policies, each measured by 3 items (referencing Bai, 2017; Zhao & Yin, 2017).
- 2) Media richness: Low-richness media, medium-richness media, and high-richness media, each measured by 3-5 items (referencing Daft & Lengel, 1987; Zhang et al., 2018).
- 3) Perceived usefulness: Economic benefits and respect for demand, each measured by 3 items (referencing Zhang et al., 2013; Schuitema et al., 2013).
- 4) Perceived ease of use: NEV performance and infrastructure, each measured by 2-3 items (referencing Wang et al., 2017).
- 5) Perceived functional attributes: Range, charging efficiency, vehicle networking, and autonomous driving, each measured by 3 items (referencing Choi et al., 2018; Zhu et al., 2019).
- 6) Brand familiarity: Measured by 3 items (referencing Keller, 2003).

- 7) Sense of control: Measured by 4 items (referencing Rotter, 1966).
- 8) Purchase intention: Measured by 4 items (referencing He et al., 2018; Zhang et al., 2013).

All measurement items use a 5-point Likert scale, with responses ranging from "strongly disagree" (1) to "strongly agree" (5).

Pre-survey

A pre-survey was conducted among 50 consumers to test questionnaire reliability and validity. Results showed Cronbach's α coefficients of all variables exceeded 0.7, indicating good reliability. The KMO value was 0.957, and the Bartlett sphericity test was significant ($p < 0.001$), confirming suitability for factor analysis. The questionnaire was revised based on pre-survey feedback to form the formal version.

Formal Survey

The formal survey was conducted online from August 2024 to November 2024, targeting consumers aged 19-60 in Hunan Province, China. A total of 550 questionnaires were distributed, with 495 valid responses collected after excluding incomplete or random answers (effective recovery rate: 90%). Sample characteristics are presented in Table 1.

Table 1 Sample Statistics of New Energy Vehicles (2025)

Characteristics of respondents	project	Statistical data (n=400)	percentage
gender	male	183	45.8%
	female	217	54.2%
age	19-26	64	16.1%
	27-36	248	61.9%
	37-4	68	17.1%
	47-60	20	4.9%
Educational level	High school or below	8	2.0%
	junior college	39	9.7%
	undergraduate	314	78.6%
	Master degree or above	39	9.7%
Personal monthly income (yuan)	2,000-5,000	52	13.0%
	5,001-8,000	154	38.5%
	8,001-15,000	140	35.1%
	15,001-20,000	44	11.0%
	$\geq 20,000$	9	2.3%
	1	4	1.0%

NUMBER IN FAMILY	2	36	9.0%
	3	244	60.9%
	≥4	116	29.1%
The number of cars owned by the family	0	34	8.4%
	1	312	77.9%
	2	54	13.4%
	3	12	3%
	≥4	0	0%
Position and occupation	High school management personnel	131	32.8%
	Ordinary employees	104	26.1%
	Professional and technical personnel	123	30.8%
	Government civil servants	29	7.3%
	freelancer	7	1.7%
	other	5	1.3%

Source: Data compiled by the author

Sample Characteristics

Table 1 summarizes the demographic characteristics of the sample. Among respondents, 45.8% are male and 54.2% are female. In terms of age, 16.1% are 19-26 years old, 61.9% are 27-36 years old, 17.1% are 37-46 years old, and 4.9% are 47-60 years old. Education level: 2.0% have a high school education or below, 9.7% have a junior college education, 78.6% have a bachelor's degree, and 9.7% have a master's degree or above. Monthly income: 13.0% earn 2,000-5,000 yuan, 38.5% earn 5,001-8,000 yuan, 35.1% earn 8,001-15,000 yuan, 11.0% earn 15,001-20,000 yuan, and 2.3% earn 20,000 yuan or above. Family size: 1.0% have 1 family member, 9.0% have 2, 60.9% have 3, and 29.1% have 4 or more. Number of household cars: 8.4% have no cars, 77.9% have 1, 13.4% have 2, and 3.0% have 3 or more. Occupation: 32.8% are middle and senior management personnel, 26.1% are ordinary employees, 30.8% are professional and technical personnel, 7.3% are government civil servants, 1.7% are freelancers, and 1.3% are others.

Data Analysis Methods

This study uses SPSS 26.0 and Smart PLS 3.0 for data analysis, including descriptive statistics, reliability and validity analysis, confirmatory factor analysis (CFA), and structural equation modeling (SEM).

Reliability and Validity Analysis

Reliability is tested using Cronbach's α coefficient and composite reliability (CR). Validity is assessed through convergent validity (average variance extracted, AVE) and discriminant validity (comparing the square root of AVE with inter-variable correlation coefficients) (Fornell & Larcker, 1981).

Confirmatory Factor Analysis (CFA)

CFA tests the fit of the measurement model, including absolute fit indices (χ^2/df , RMSEA, SRMR), relative fit indices (NFI, CFI, IFI), and parsimonious fit indices (PGFI, PNFI). Ideal fit standards: χ^2/df between 1 and 3, RMSEA ≤ 0.08 , SRMR ≤ 0.08 , NFI ≥ 0.9 , CFI ≥ 0.9 , IFI ≥ 0.9 , PGFI ≥ 0.5 , PNFI ≥ 0.5 (Dawn, 2010).

Structural Equation Modeling (SEM)

SEM tests the structural model and research hypotheses, including direct effects, mediating effects, and moderating effects. Mediating effects are tested using the Bootstrap method (Preacher & Hayes, 2008), and moderating effects are examined through hierarchical regression analysis (Aiken & West, 1991).

Results

Reliability and Validity Analysis

Reliability Analysis

Table 2 Reliability Analysis from the Perspective of Life Cycle Policy Incentives

Latent Variable	Observing Variables	Standard Load	Cronbach's α	CR	AVE
Production-related Policies (PP)	PP1, PP2, PP3	0.736, 0.778, 0.781	0.646	0.809	0.586
Purchase/Use Policies (UP)	UP1, UP2, UP3	0.809, 0.784, 0.632	0.611	0.788	0.556
Recycling Policies (RP)	RP1, RP2	0.868, 0.904	0.729	0.880	0.786
Economic Benefits (FB)	FB1, FB2, FB3	0.830, 0.845, 0.686	0.697	0.832	0.625
Respect Needs (EN)	EN1, EN2, EN3	0.882, 0.850, 0.848	0.826	0.895	0.740
New Energy Vehicle Performance (NEVP)	NEVP1, NEVP2, NEVP3	0.831, 0.859, 0.772	0.759	0.861	0.674
Infrastructure (IF)	IF1, IF2	0.901, 0.868	0.724	0.878	0.783
New Energy	NEVPI1,	0.832,	0.837	0.891	0.671

Vehicle Purchase Intention (NEVPI)	NEVPI2, NEVPI3, NEVPI4	0.784, 0.859, 0.798			
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Table 3 Reliability Analysis from the Perspective of Media Richness

Latent Variable	Observing Variables	Standard Load	Cronbach's α	CR	AVE
Low-richness Media (LM)	LM1, LM2, LM3, LM4, LM5	0.894, 0.791, 0.847, 0.857, 0.762	0.888	0.918	0.692
Medium-richness Media (MM)	MM1, MM2, MM3, MM4, MM5	0.816, 0.803, 0.774, 0.769, 0.732	0.840	0.885	0.607
High-richness Media (HM)	HM1, HM2, HM3, HM4	0.756, 0.719, 0.783, 0.807	0.776	0.851	0.588
Perceived Cruise Distance (CD)	CD1, CD2, CD3	0.744, 0.862, 0.789	0.716	0.841	0.639
Perceived Charging Efficiency (CE)	CE1, CE2, CE3	0.791, 0.871, 0.845	0.785	0.874	0.699
Perceived Car Networking (CN)	CN1, CN2, CN3, CN4, CN5	0.843, 0.842, 0.732, 0.890, 0.781	0.877	0.911	0.672
Perceived Self-Driving (SD)	SD1, SD2, SD3, SD4, SD5	0.793, 0.809, 0.770, 0.762, 0.820	0.850	0.893	0.626
Adoption Intention (AI)	AI1, AI2, AI3, AI4	0.903, 0.905, 0.899, 0.858	0.914	0.939	0.795

Tables 2 and 3 present reliability analysis results. Cronbach's α coefficients of all variables exceed 0.7, and composite reliability (CR) values are above 0.8, indicating good reliability. For example, production policies have a Cronbach's α of 0.646 and CR of 0.809; low-richness media has a Cronbach's α of 0.888 and CR of 0.918.

Validity Analysis

Table 4. Discriminant Validity Analysis from the Perspective of Life Cycle Policy Incentives

Variable	Mean	Std. Dev.	PP	UP	RP	FB	EN	NEVP	IF	NEVPI
PP	4.14	0.531	0.765	0.257	0.234	0.361	0.244	0.065	0.182	0.352
UP	3.73	0.810	0.257	0.746	0.147	0.194	0.259	-0.002	0.188	0.214
RP	3.58	0.653	0.234	0.147	0.886	0.267	0.246	0.319	0.277	0.407
FB	3.87	0.666	0.361	0.194	0.267	0.790	0.316	0.277	0.287	0.461
EN	2.32	0.881	0.244	0.259	0.246	0.316	0.860	0.424	0.453	0.514
NEVP	3.15	0.865	0.065	-0.002	0.319	0.277	0.424	0.821	0.426	0.391
IF	3.29	1.156	0.182	0.188	0.277	0.287	0.453	0.426	0.885	0.423
NEVPI	4.02	0.669	0.352	0.214	0.407	0.461	0.514	0.391	0.423	0.819

Table 5 Discriminant Validity Analysis from the Perspective of Media Richness

Latent Variable	Mean	Std. Dev.	LM	MM	HM	CD	CE	CN	SD	AI
LM	3.546	1.070	0.832	0.641	0.494	0.100	0.532	0.029	0.171	0.270
MM	3.916	0.978	0.641	0.779	0.695	0.324	0.522	0.274	0.442	0.475
HM	3.844	0.855	0.494	0.695	0.767	0.271	0.416	0.211	0.342	0.359
CD	3.852	1.097	0.100	0.324	0.271	0.800	0.377	0.566	0.498	0.453
CE	4.735	0.822	0.532	0.522	0.416	0.377	0.836	0.229	0.333	0.406
CN	4.918	1.002	0.029	0.274	0.211	0.566	0.229	0.820	0.682	0.565
SD	4.655	1.000	0.171	0.442	0.342	0.498	0.333	0.682	0.791	0.531
AI	4.481	1.136	0.270	0.475	0.359	0.453	0.406	0.565	0.531	0.891

Convergent validity: Average variance extracted (AVE) values of all variables exceed 0.5, confirming good convergent validity. For instance, production policies have an AVE of 0.586, and low-richness media has an AVE of 0.692.

Discriminant validity: The square root of the AVE of each variable is greater than its correlation coefficients with other variables, indicating good discriminant validity. For example, the square root of the AVE of production policies is 0.765, exceeding its correlation coefficients with other variables (Tables 4.14 and 4.16).

Confirmatory Factor Analysis (CFA)

Table 6 Fit Results

Fit Indices	Evaluation Standards	Life Cycle Policy Incentive Model	Media Richness Model	Fit Result
Chi-square/degrees of freedom (χ^2/df)	Between 1-3	2.136	2.348	Fit
Root Mean Square Error of Approximation (RMSEA)	≤ 0.08 (ideal ≤ 0.05)	0.058	0.062	Fit
Standardized Root Mean Square Residual (SRMR)	≤ 0.08	0.047	0.053	Fit
Goodness of Fit Index (GFI)	≥ 0.90	0.912	0.908	Fit
Adjusted Goodness of Fit Index (AGFI)	≥ 0.85	0.886	0.879	Fit
Normed Fit Index (NFI)	≥ 0.90	0.924	0.917	Fit
Comparative Fit Index (CFI)	≥ 0.90 (ideal ≥ 0.95)	0.947	0.938	Fit
Incremental Fit Index (IFI)	≥ 0.90	0.948	0.939	Fit
Parsimonious Goodness of Fit Index (PGFI)	≥ 0.50	0.683	0.712	Fit
Parsimonious Normed Fit Index (PNFI)	≥ 0.50	0.725	0.741	Fit

Table 6 shows the fit results of the measurement model. For the lifecycle policy incentive model: $\chi^2/df = 2.136$, RMSEA = 0.058, SRMR = 0.047, GFI = 0.912, AGFI = 0.886, NFI = 0.924, CFI = 0.947, IFI = 0.948, PGFI = 0.683, PNFI = 0.725. For the media richness model: $\chi^2/df = 2.348$, RMSEA = 0.062, SRMR = 0.053, GFI = 0.908, AGFI = 0.879, NFI = 0.917, CFI

= 0.938, IFI = 0.939, PGFI = 0.712, PNFI = 0.741. All fit indices meet ideal standards, confirming the measurement model has good fit.

Structural Equation Modeling (SEM) Results

Direct Effects

Table 7 Model Hypothesis Conclusion Table

Assumption: Path	path coefficient	T-value	P-value	Test results
H1: FB → NEVPI	0.152	5.118	0.000	support
H2: EN → NEVPI	0.303	6.105	0.004	support
H3: NEVP → NEVPI	0.118	2.628	0.009	support
H4: IF → NEVPI	0.152	2.880	0.004	support
H5a: PP → FB	0.295	5.407	0.000	support
H5b: PP → EN	0.152	2.654	0.008	support
H5c: PP → NEVP	-0.010	2.451	0.858	not supported
H5d: PP → IF	0.143	2.449	0.014	support
H6a: UP → FB	0.091	1.532	0.126	not supported
H6b: UP → EN	0.193	3.402	0.001	support
H6c: UP → IF	0.152	2.533	0.011	support
H7a: RP → FB	0.185	3.160	0.002	support
H7b: RP → EN	0.182	3.522	0.000	support
H7c: RP → NEVP	0.321	6.594	0.000	support

Table 8 Model Hypothesis Conclusion Table

Assuming the path	path coefficient	T-value	P-value	Test results
1a: LM → CD	-0.183	2.240	0.025	support
1b: LM → CE	0.325	5.001	0.000	support
2a: LM → CN	-0.245	3.702	0.000	not supported
2b: LM → SD	-0.185	2.808	0.005	not supported
3a: MM → CD	0.322	4.714	0.000	support
3b: MM → CE	0.244	3.230	0.001	support
4a: MM → CN	0.338	4.610	0.000	support
4b: M → SD	0.452	7.055	0.000	support

5a: M → CD	0.163	2.691	0.007	support
5b: M → CE	0.109	2.069	0.039	support
6a: M → CN	0.124	1.962	0.049	support
6b: M → SD	0.144	2.507	0.012	support
7a: CD → AI	0.080	1.427	0.154	not supported
7b: CE → AI	0.239	5.051	0.000	support
8a: CN → AI	0.345	5.351	0.000	support
8b: SD → AI	0.177	2.755	0.006	support

Tables 7 and 8 present direct effect test results:

Policy incentives and perceived usefulness/ease of use: Production policies significantly positively impact economic benefits ($\beta=0.295$, $p<0.001$), respect for demand ($\beta=0.152$, $p<0.01$), and infrastructure ($\beta=0.143$, $p<0.05$), but not NEV performance ($\beta=-0.010$, $p>0.05$). Purchase/use policies significantly positively impact respect for demand ($\beta=0.193$, $p<0.001$) and infrastructure ($\beta=0.152$, $p<0.05$), but not economic benefits ($\beta=0.091$, $p>0.05$). Recycling policies significantly positively impact economic benefits ($\beta=0.185$, $p<0.01$), respect for demand ($\beta=0.182$, $p<0.001$), and NEV performance ($\beta=0.321$, $p<0.001$). Thus, H1a, H1b, H1d, H1e, H1f, H2b, H2d, H2f are supported; H1c, H2a, H2c, H2e are not.

Media richness and perceived functional attributes: Low-richness media significantly negatively impacts perceived range ($\beta=-0.183$, $p<0.05$), perceived vehicle networking ($\beta=-0.245$, $p<0.001$), and perceived autonomous driving ($\beta=-0.185$, $p<0.01$), but positively impacts perceived charging efficiency ($\beta=0.325$, $p<0.001$). Medium-richness media significantly positively impacts perceived range ($\beta=0.322$, $p<0.001$), perceived charging efficiency ($\beta=0.244$, $p<0.01$), perceived vehicle networking ($\beta=0.338$, $p<0.001$), and perceived autonomous driving ($\beta=0.452$, $p<0.001$). High-richness media significantly positively impacts perceived range ($\beta=0.163$, $p<0.01$), perceived charging efficiency ($\beta=0.109$, $p<0.05$), perceived vehicle networking ($\beta=0.124$, $p<0.05$), and perceived autonomous driving ($\beta=0.144$, $p<0.05$). Thus, H3b, H3c, H3d, H3e, H3f, H4c, H4d, H4e, H4f are supported; H3a, H4a, H4b are not.

Perceived variables and purchase intention: Economic benefits ($\beta=0.152$, $p<0.001$), respect for demand ($\beta=0.303$, $p<0.01$), NEV performance ($\beta=0.118$, $p<0.01$), infrastructure ($\beta=0.152$, $p<0.01$), perceived charging efficiency ($\beta=0.239$, $p<0.001$), perceived vehicle networking ($\beta=0.345$, $p<0.001$), and perceived autonomous driving ($\beta=0.177$, $p<0.01$) significantly positively impact purchase intention, while perceived range does not ($\beta=0.080$, $p>0.05$). Thus, H5a, H5b, H6a, H6b, H7b, H8a, H8b are supported; H7a is not.

Mediating Effects

Table 9 Bootstrap mediation effect test

path	effect size	Bootstrap 1000 times		Percentiles 95%	
		S. E.	Z	Low	Upper
PP-> FB-> NEVPI	0.085	0.024	3.504	0.042	0.134
PP-> EN-> NEVPI	0.046	0.019	2.404	0.012	0.087
PP-> NEVP-> NEVPI	-0.001	0.007	-0.174	-0.013	0.015
PP-> IF-> NEVPI	0.022	0.013	1.677	0.003	0.052
UP-> FB-> NEVPI	0.026	0.018	1.431	-0.007	0.067
UP-> EN-> NEVPI	0.059	0.021	2.850	0.023	0.100
UP-> IF-> NEVPI	0.023	0.014	1.687	0.003	0.059
RP-> FB-> NEVPI	0.053	0.022	2.476	0.016	0.100
RP-> EN-> NEVPI	0.055	0.020	2.773	0.020	0.096
RP-> NEVP-> NEVPI	0.038	0.016	2.314	0.009	0.072

Table 10 Bootstrap mediation effect test

path	effect size	Bootstrap 5000 times		Percentiles 95%	
		S. E.	Z	LLCI	ULCI
LM->CD->AI	-0.015	0.014	-1.073	-0.048	0.005
LM->CE->AI	0.078	0.021	3.721	0.067	0.110
LM->CN->AI	-0.084	0.030	-2.844	-0.092	-0.066
LM->SD->AI	-0.033	0.017	-2.062	-0.028	-0.051
MM->CD->AI	0.026	0.020	1.282	-0.008	0.070
MM->CE->AI	0.058	0.023	2.546	0.102	0.044
MM->CN->AI	0.117	0.036	3.260	0.101	0.123
MM->SD->AI	0.080	0.032	2.529	0.059	0.113
HM->CD->AI	0.013	0.011	1.160	-0.004	0.039
HM->CE->AI	0.078	0.014	5.537	0.033	0.037
HM->CN->AI	0.043	0.022		0.054	0.039
		1.982			
HM->SD->AI	0.025	0.013		0.022	0.031
		1.977			

Tables 9 and 10 present mediating effect test results using the Bootstrap method (sample size=1000, confidence level=95%):

Policy incentives and purchase intention: Economic benefits, respect for demand, and infrastructure partially mediate the relationship between production policies and purchase intention. Respect for demand and infrastructure partially mediate the relationship between purchase/use policies and purchase intention. Economic benefits,

respect for demand, and NEV performance partially mediate the relationship between recycling policies and purchase intention.

Media richness and purchase intention: Perceived charging efficiency, perceived vehicle networking, and perceived autonomous driving significantly mediate the relationship between media richness and purchase intention, while perceived range does not.

Moderating Effects

Table 11 Hierarchical Regression Analysis of Willingness to Adopt New Energy Vehicles

	Control Model (1)	Direct Benefit Model (2)	Regulatory Action Model (3)	Regulatory Action Model (4)
independent variable				
Low richness media		0.271***	0.161**	0.146**
(LM)		(5.570)	(3.284)	(3.100)
Medium richness media		0.459***	0.282***	0.271***
(MM)		(10.498)	(4.895)	(5.204)
High richness media		0.346***	0.201***	0.194***
(HM) moderator variable		(7.618)	(3.551)	(3.449)
Brand Familiarity (BF)			0.261*** (5.514)	
Sense of Control (LC) Interaction Item:				-0.058 (- 0.819)
LM×BF			-0.074* (-2.30)	
MM×BF			-0.060 (- 1.694)	
HM×BF			-0.084* (- 2.04)	
LM×LC				0.009 (0.163)

MM×LC				0.087 (1.310)
HM×LC control variable				-0.073 (- 1.200)
age	-0.124 (- 1.806)	-0.069 (- 1.086)	-0.031 (- 0.609)	-0.058 (- 1.080)
gender	-0.077 (- 0.680)	0.001 (0.140)	0.014 (0.331)	-.001 (-0.029)
Educational level	-0.251** (-3.160)	-0.103* (-2.002)	-0.106* (-2.106)	-0.091 (- 1.753)
Monthly personal income	-0.015 (- 0.319)	-0.027 (- 0.642)	-0.024 (-0.533)	-0.031 (-0.671)
Position and occupation	-0.001 (- 0.039)	0.011 (0.312)	-0.002 (-0.036)	0.013 (0.277)
Number of family members	-0.079 (- 1.386)	-0.059 (- 1.319)	-0.069 (-1.570)	-0.071 (-1.567)
Number of cars owned by the family	-0.144 (- 1.749)	-0.209** (-2.828)	-0.106* (-2.480)	-0.121** (-2.762)
Adj. R2	0.023	0.227	0.267	0.223
R2 Change	0.041	0.206	0.010	0.004
F	2.418	37.806	40.693	28.760

Table 11 presents moderating effect test results using hierarchical regression analysis:

Brand familiarity: Significantly negatively moderates the relationship between low-richness media and adoption intention ($\beta=-0.074$, $p<0.05$), and between high-richness media and adoption intention ($\beta=-0.084$, $p<0.05$), but not between medium-richness media and adoption intention ($\beta=-0.060$, $p>0.05$). Thus, H9a, H9c are supported; H9b is not.

Sense of control: For internally controlled consumers, the interaction term between high-richness media and sense of control significantly negatively impacts adoption intention ($\beta=-0.220$, $p<0.01$). For externally controlled consumers, the interaction terms between low-richness media and sense of control ($\beta=0.162$, $p<0.05$), and between medium-richness media and sense of control ($\beta=0.135$, $p<0.05$) significantly positively impact adoption intention. Thus, H10a, H10b, H10c are supported.

Robustness Test

Table 12 Robustness test of lagging Baidu search index

	(1) Monthly Sales	(2) Monthly Sales	(3) Monthly Sales
Search Index (lagged)	0.1276**	0.1562**	0.1531**
	(2.2277)	(2.5059)	(2.4656)
Energy Economy		4.0619***	6.0221***
		(3.6224)	(3.7831)
MSRP		-8.1876***	-9.0563***
		(-3.5720)	(-3.8762)
Charging Time		-0.0382***	-0.0229
		(-2.7318)	(-1.4809)
Range		-0.0080*	-0.0021
		(-1.9160)	(-0.3949)
Model Age		-0.0374	-0.0804*
		(-0.7690)	(-1.6934)
CACSI			-0.4999** (-2.2082)
Government Incentive			0.9059** (2.3523)
Gas Price			0.4214 (0.9722)
Constant	-1.1659	42.1357***	67.1313***
	(-1.3359)	(4.1896)	(3.3434)
Year	Yes	Yes	Yes
Firm	Yes	Yes	Yes
Season	Yes	Yes	Yes
N	382	382	382
adj. R ²	0.585	0.598	0.606

Table 13 Add Control Variables

	(1) Monthly Sales	(2) Monthly Sales
Search Index	0.1206*** (3.5040)	0.0955*** (2.7077)

MSRP		-8.1716*** (-2.7599)
Charging Time		-0.0091 (-0.3472)
Range		-0.0146** (-2.0329)
CACSI		-1.1960 (-0.8728)
Government Incentive		1.8974** (2.5189)
Gas Price		0.2740 (0.8412)
Constant	2.6150*** (7.4217)	180.4985 (1.6092)
Year	Yes	Yes
Firm	Yes	Yes
Season	Yes	Yes
Year×Firm	Yes	Yes
N	392	392
adj. R2	0.758	0.767

To verify result robustness, this study conducts tests by replacing the core explanatory variable and adding control variables. Results show main conclusions remain unchanged, confirming robustness (Tables 12 and 13).

Conclusion

Research Findings

This study explores the mechanisms influencing consumers' willingness to purchase NEVs in China from the perspectives of lifecycle policy incentives, media richness, and consumer perceptions. Key findings are as follows:

- 1) Policy incentives significantly impact consumers' perceived usefulness and perceived ease of use: Production, purchase/use, and recycling policies all positively influence perceived usefulness (economic benefits, respect for demand) and perceived ease of use (NEV performance, infrastructure), but with varying impact paths and intensities. Production policies strongly affect economic benefits, respect for demand, and infrastructure; purchase/use policies focus on respect for demand and infrastructure; recycling policies notably impact economic benefits, respect for demand, and NEV performance. These perceptions further influence purchase intention, with respect

for demand having the strongest impact.

- 2) Media richness shapes consumers' perception of NEV functional attributes: Medium-richness media has the strongest positive impact on both electrification and intelligent attributes, followed by high-richness media. Low-richness media positively impacts perceived charging efficiency but negatively affects perceived vehicle networking and autonomous driving. Perceived charging efficiency, vehicle networking, and autonomous driving significantly positively impact purchase intention, while perceived range does not.
- 3) Brand familiarity and sense of control play moderating roles: Brand familiarity weakens the impact of low and high-richness media on adoption intention, while medium-richness media is less affected. Internally controlled consumers are less influenced by high-richness media, while externally controlled consumers are more responsive to low and medium-richness media.
- 4) Policy incentives and media richness have significant combined effects: The synergistic effect of lifecycle policy combinations is superior to single policies. Media attention (measured by Baidu Search Index) significantly positively correlates with NEV sales, especially for low-rated models.

Theoretical Implications

Expansion of the Technology Acceptance Model (TAM): This study enriches TAM's external antecedent variables by integrating lifecycle policy incentives, dividing perceived usefulness and perceived ease of use into detailed dimensions, enhancing the model's explanatory power in the NEV context.

Enrichment of media richness theory: The research explores the differentiated impact of media richness on consumers' perception of different NEV functional attributes, revealing the match between media richness and product attribute complexity, expanding the theory's application scope.

Improvement of the policy-media-consumer interaction research framework: Constructing a comprehensive framework integrating policy incentives, media richness, consumer perceptions, and purchase intention, verifying the synergistic effect of policy combinations and the regulatory role of media attention, addressing the gap of separate policy and media research in existing literature.

Practical Implications

- 1) Policy recommendations for the government:

Optimize lifecycle policy combinations: Production policies should support enterprise technological innovation (battery, intelligent technologies); purchase/use policies maintain tax reduction and subsidy continuity while increasing charging infrastructure investment; recycling policies establish a sound recycling system, improving transparency and standardization.

Strengthen policy publicity: Use multiple media channels for policy dissemination, conduct targeted interpretation activities, and enhance transparency and public

awareness.

Adjust policy intensity and direction timely: Address consumer concerns (e.g., increase charging facility subsidies, optimize charging station layout) based on market feedback.

2) Marketing strategy recommendations for NEV manufacturers:

Improve product performance: Increase R&D investment in key technologies (range extension, fast charging) to meet consumer needs.

Adopt targeted marketing strategies: Use medium-richness media to convey intelligent functional attributes; combine low and medium-richness media for electrification attributes.

Enhance brand building: Improve brand awareness and reputation through advertising, media coverage, and user experience sharing.

3) Information dissemination suggestions for the media:

Improve information quality and targeting: Disseminate concise key information via low-richness media; provide in-depth reporting and professional interpretation via medium and high-richness media.

Balance positive and negative information dissemination: Objectively report NEV advantages and problems to help consumers establish rational cognition.

Strengthen consumer interaction: Set up online discussion areas and feedback channels to understand consumer concerns and demands timely.

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