BYD Car Purchase Decision in Shandong, China : An Extended Theory of Planned Behavior

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Abstract

This study investigates the factors influencing consumers' purchase decisions of BYD new energy vehicles in Shandong Province, China, utilizing Theory of Planned Behavior (TPB) framework. By integrating attitude, subjective norms, perceived behavioral control, and environmental awareness as key variables, the research aims to identify how these factors shape consumers' intention to purchase BYD cars. A quantitative approach was adopted, with a questionnaire survey distributed to 469 valid respondents in Shandong. Descriptive statistics, reliability and validity analysis, and multiple regression analysis were used to process the data. The findings indicate that subjective norms and perceived behavioral control have a significant positive impact on purchase decisions, while environmental awareness shows a significant negative effect. Attitude, however, did not exhibit a statistically significant influence. Demographically, the sample was dominated by young males (18–24 years old) with junior college education and middle-income levels, reflecting a strong appeal of BYD among this group. The research contributes to understanding regional consumer behavior in the new energy vehicle market and provides actionable marketing insights for BYD to enhance its market competitiveness in Shandong.

Keyword: Theory of Planned Behavior (TPB), purchase decisions, BYD, Environmental awareness

Introduction

Environmental protection and climate change have become the focus of attention for governments and international organizations worldwide. With the signing of the Paris Agreement, countries have committed to keeping the global average temperature rise below 2 ° C compared to pre industrial levels and achieving the global goal of carbon neutrality by 2050-2100.As an important source of global carbon emissions, the automotive industry's emission reduction actions are crucial to achieving this goal. As a leading enterprise in new energy vehicles, BYD actively responds to the national goal of "peaking carbon emissions before 2030 and achieving carbon neutrality before 2060", promotes efforts to address climate change, and explores carbon footprint

standards for the new energy vehicle industry (Cai Lihua, 2024). The automotive industry is facing the challenge of transitioning from traditional fuel vehicles to new energy vehicles. BYD plays an important role in this transformation by developing green technology products such as photovoltaics, energy storage, and electric vehicles, connecting all aspects of energy acquisition, storage, and application, and providing a comprehensive green solution for cities. At the same time, BYD is also promoting low-carbon development in areas such as public transportation, engineering, and logistics globally, accelerating the replacement of fuel vehicles with new energy vehicles in the private car sector (Song et al., 2024). At the consumer level, BYD's consumers are mainly concentrated between the ages of 25-45, with higher educational backgrounds and middle to high income levels. They are concerned about environmental awareness, fuel economy, and quality assurance, and hope to purchase a car product that is both environmentally friendly and reliable in quality. BYD consumers have increasingly high demands for the environmental performance of cars, and they reduce environmental pollution by purchasing BYD vehicles. BYD consumers also hope that cars will have intelligent functions such as intelligent driving assistance systems, navigation systems, and intelligent interactive interfaces to enhance driving experience and safety (Gan et al., 2024).

Purchasing BYD cars offers multifaceted benefits that align with both individual consumer interests and broader societal goals. Economically, BYD's strong financial performance ensures product affordability and long-term value, as its robust R&D investments drive continuous innovation in battery efficiency and vehicle performance (Zhang, 2024). Policy-wise, BYD benefits from China's subsidies and tax incentives for new energy vehicles (NEVs), reducing ownership costs and enhancing accessibility (Yang, 2024). Technologically, BYD's leadership in green technologies, such as its Blade Battery and integrated energy solutions, provides consumers with reliable, high-performance vehicles that outperform traditional fuel cars in energy efficiency and emissions reduction (Zhou et al., 2024). Additionally, BYD's commitment to sustainability extends to its supply chain and corporate strategies, such as blockchain-enabled transparency and carbon-neutral production, which resonate with environmentally conscious buyers (Jun, 2023). Marketing strategies like experiential exhibitions further amplify brand appeal, showcasing BYD's smart features and eco-friendly designs to attract tech-savvy consumers (Gan et al., 2024). These advantages collectively position BYD as a cost-effective, future-proof, and socially responsible choice for Shandong consumers.

Therefore, the research background of BYD's consumer purchasing decisions is closely related to environmental protection, which is not only reflected in the macro transformation at the global and industry levels, but also in the micro needs of individual consumers. BYD has met consumers' demands for environmental protection and intelligence through technological

innovation and environmental protection measures, while also responding to the global trend of environmental protection.

Research Objective

To study the influencing factors of consumer purchasing decisions for BYD cars in Shandong Province, China.

Literature review

Purchase Decision and BYD Consumers

A purchase decision is the process where consumers identify needs and evaluate options. For BYD consumers—both owners and potential buyers—this involves assessing product features, brand image, price, performance, environmental attributes, and personal finances (Liu, 2024). This group is influenced by preferences for new energy vehicles (NEVs), brand perception, and environmental responsibility (Liu, 2024).

Theory of Planned Behavior (TPB)

The TPB is a key framework for analyzing this decision. It states that behavioral intention is shaped by three factors: Attitude (an individual's positive or negative evaluation based on beliefs), Subjective Norms (perceived social pressure), and Perceived Behavioral Control (perceived ease or difficulty of the action). Strengthening positive attitudes is crucial for marketing NEVs (Ma Aiping, 2021).

Since the theory of planned behavior was put forward, it has been widely used in the field of consumer behavior research. The theory emphasizes that individual behavior intention is the direct factor determining behavior, and behavior intention is affected by three factors: attitude, subjective norms and perceived behavior control. With the passage of time, scholars continue to apply the theory of planned behavior to different consumption fields and explore the complex relationship between it and consumer decision-making. From the initial verification of the basic theoretical framework, it gradually develops to the detailed analysis of various influencing factors in specific consumption situations, which provides rich theoretical basis and empirical support for understanding the consumer decision-making process. The TPB's utility is well-established, applied to diverse behaviors from low-carbon vehicle purchases (Yaocuiyan, 2014) to socially responsible consumption, demonstrating its power in decoding consumer psychology.

Under the Theory of Planned Behavior (TPB) framework, environmental awareness refers to consumers' recognition of the importance of environmental protection and their concern for the impact of personal behavior on the environment. For both existing and potential users,

environmental awareness is an important factor influencing their purchasing decisions, as it relates to consumers' positive evaluations and behavioral intentions towards environmentally friendly products such as new energy vehicles (Chen, 2020).

In this study, three original factors of the TPB, namely, Attitude, Subjective Norm, Perceived behavioral control are used, together with one additional factor, refers to Environmental awareness, are to examine their effects to purchase decision among BYD potential consumers.

Research Framework

Based on the above research hypotheses, this study establishes the following Research framework:

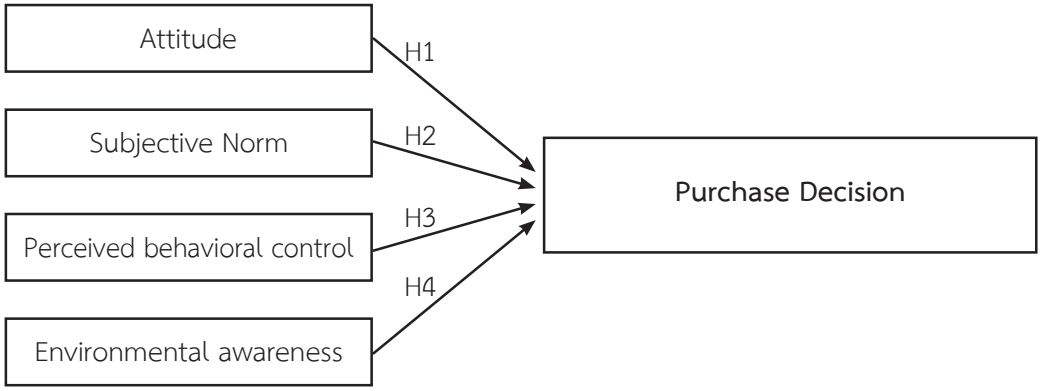

Figure 1. Research Framework

Source: Compiled by this study

Research Hypothesis

Based on the above research review and the relationship between variables, this study identifies the following fore research hypotheses:

H1 : Consumers' attitudes towards BYD's new energy vehicles have a significant positive impact on their purchasing decisions.

H2 : Subjective norms have a significant positive impact on consumers' purchasing decisions.

H3 : Perceived behavioral control has a significant positive impact on purchasing decisions.

H4 : Environmental awareness has a significant positive impact on purchasing decisions.

Research methodology

This study adopts a quantitative research method. The questionnaire with a five-point likert scale was used for data collection. The existing questionnaire items from Shalender & Sharma (2021) were adapted. The questionnaire design was based on the theory of planned behavior, covering five dimensions: attitude, subjective norms, perceived behavioral control, environmental

awareness, purchase decision. In addition, the questionnaire also collected demographic information of the respondents, such as gender, age, income level, education level, and marital status. the Cronbach's α coefficient for all dimension is above 0.70, indicating high internal consistency reliability. This suggests that the scale is stable and reliable, with items effectively reflecting their corresponding concepts.

Convenience sampling method was conducted from potential and existing consumers of BYD Auto in Shandong Province. The expected sample size for the survey is 400, which is determined based on statistical principles and expected effect size to ensure the reliability and validity of the research results. The sampling location is limited to Shandong Province, China, because Shandong Province, as an important province in China, has a large consumer group for BYD cars and can provide sufficient sample size for research (Dusida, 2024). Meanwhile, the economic development level and consumer behavior of Shandong Province have certain representativeness, which can provide reference for BYD's national market strategy.

Data collection was conducted through online questionnaires, distributed through various channels such as email, social media, and online survey platforms. This approach can improve the efficiency of data collection, while reduce costs and ensure the anonymity and security of data. The collected data was then analyzed using statistical software. The analysis methods included descriptive statistical analysis, and regression analysis to determine the relationship between different variables and evaluate the degree of influence of independent variables on the dependent variable.

Results

A total of 469 valid samples were collected in this survey. In terms of gender distribution, 79.74% of the respondents were male, while 20.26% were female, indicating a significant male majority. This may suggest that male consumers are more interested in or actively involved in BYD car purchasing behavior research. Regarding age, the 18-24 age group made up 78.89% of the sample, forming the main component. The 25-34 age group accounted for 13.86%, while those aged 35 and above were less represented, suggesting that young consumers dominate the potential BYD car buyers in Shandong. In terms of annual income, 63.97% of respondents had an annual income below 30,000 yuan, while 23.45% had an annual income above 100,000 yuan, indicating a significant middle-income group. This may be related to BYD's market positioning. In terms of education level, 51.39% of the respondents had a junior college degree, 28.78% had a bachelor's degree, 4.05% had a master's degree, and 11.73% had a doctorate, indicating a relatively high level of education.

In terms of marital status, 86.99% were unmarried, while 9.17% were married and 3.84% were divorced, which aligns with the higher proportion of young respondents in the age distribution. In terms of the number of existing vehicles, 72.49% of families own one four-wheeled car, 6.61% have two, and 20.90% own three or more. This indicates that most families own at least one car and may be considering a car upgrade or additional purchases.

Regarding self-assessment of electric vehicle knowledge, 46.27% of respondents are at the Middle level, while 18.76% are Very High and 17.48% are Very Low, reflecting varying levels of knowledge about electric vehicles among consumers. In terms of purchasing experience, 207 people (44.14%) have purchased an electric vehicle, while 262 people (55.86%) have not, providing a data foundation for studying the purchasing decisions of different groups with varying levels of purchasing experience.

The regression analysis, with purchase intention as the dependent variable and attitude, subjective norms, perceived behavioral control, and environmental awareness as independent variables, revealed that the model demonstrated good overall fit with an R^2 of 0.875, indicating these four factors explained 87.5% of the variance in purchase intention. The adjusted R^2 of 0.874 further confirmed strong explanatory power after controlling for sample size effects. The F-test result of 815.358 (df=4,464) with p=0.000 <0.01 confirmed statistical significance. Additionally, the D-W value of 2.028 approached the ideal 2, suggesting no significant autocorrelation in residuals.

Regarding regression effects of variables: Subjective Norm (B=1.532, standard error = 0.089) shows the largest standardized coefficient Beta (0.738) among all variables, with a t-value of 17.168 and p=0.000 <0.01, indicating a significant positive influence on purchase intention and serving as the most critical factor. Perceived Behavioral Control (B=0.484, standard error = 0.106) demonstrates a standardized coefficient Beta of 0.230, t=4.562, and p=0.000 <0.01, also showing a significant positive impact. Environmental Awareness (B=-0.220, standard error = 0.083) exhibits a standardized coefficient Beta of-0.102, t=-2.660, and p=0.008 <0.01, indicating a significant negative influence. Attitude (B=0.164, standard error = 0.106) shows a standardized coefficient Beta of 0.077, t=1.549, and p=0.122> 0.05, with its effect failing to reach statistical significance.

Table 1 Multiple Regression Analysis Table

model	Non-standardized coefficient		Standardization coefficients	t	p
	B	standard error	Beta		
Constant	-0.152	0.564	-	-0.270	0.788
Attitude	0.164	0.106	0.077	1.549	0.122
Subjective norms	1.532	0.089	0.738	17.168	0.000**
Perceived behavioral control	0.484	0.106	0.230	4.562	0.000**
Environmental awareness	-0.220	0.083	-0.102	-2.660	0.008**
R^2	0.875				
Adjust R^2	0.874				
F	F (4,464)=815.358,p=0.000				
D-W price	2.028				

Note: The dependent variable is purchasing decision intention

* p<0.05 ** p<0.01

The multiple regression results regarding the hypotheses about BYD car purchase decisions in Shandong Province show varying outcomes. The hypothesis that consumers' attitudes toward BYD have a significant positive impact on their purchase decisions is not supported. In contrast, the hypothesis that subjective norms have a significant positive impact on purchase decisions is supported. Similarly, the hypothesis that perceived behavioral control has a significant positive impact on purchase decisions is supported. Additionally, the hypothesis that environmental awareness has a significant positive impact on purchase decisions is also supported.

Table 2 Hypothesis Testing Results Table

Hypothesis		Testing Result
H1	Consumers' attitudes toward BYD have a significant positive impact on purchase decisions.	Not Supported
H2	Subjective norms have a significant positive impact on purchase decisions.	Supported
H3	Perceived behavioral control has a significant positive impact on purchase decisions.	Supported
H4	Environmental awareness has a significant positive impact on purchase decisions.	Supported

Discussion and conclusion

It was found that Subjective norms and perceived behavioral control significantly drive BYD purchase decisions in Shandong, while environmental awareness unexpectedly has a negative impact. Attitude showed no significant effect. The sample's youth (18–24) and male dominance highlight BYD's strong appeal to this demographic.

The study's findings resonate with numerous prior studies. For instance, Zhou Jiancheng et al. (2024) emphasize that BYD's supply chain management and extended warranty services enhance consumer confidence, which aligns with our results on perceived behavioral control. Duan Bing (2023) highlights the role of subjective norms in marketing, asserting that social influence significantly drives purchasing behavior-a conclusion strongly supported by our data. Additionally, Yang Shuhui (2024) notes that consumers increasingly favor brands committed to green development, which mirrors the significant impact of environmental awareness observed in this study.

This research extends the TPB by explicitly integrating environmental awareness, demonstrating its independent effect on NEV purchase decisions. Unlike general consumer behavior studies, this focus on Shandong-an industrial province with distinct economic and cultural characteristics-provides nuanced insights. For example, Gan Wenxin et al. (2024) emphasize the role of exhibition marketing in NEV promotion, while our study highlights the need to tailor strategies to regional demographics, such as young, educated consumers. Furthermore, by linking BYD's technological innovations (e.g., Blade Battery) to consumer attitudes, the study bridges technological advancement with behavioral theory, offering a comprehensive framework for NEV market analysis (Jun, 2023; Zhou et al., 2024).

Further research may track consumer attitudes and purchase intentions over time to examine how factors like policy changes or technological advancements influence decision-making. Extend the study to other provinces or countries to explore how cultural values (e.g., collectivism vs. individualism) moderate the effects of subjective norms and environmental awareness. Investigate the impact of autonomous driving features, vehicle-to-grid (V2G) technology, or shared mobility models on BYD purchase decisions, integrating frameworks like the Technology Acceptance Model (TAM). The future research may also explore factors influencing customer loyalty and word-of-mouth recommendations among BYD owners, bridging the intention-behavior gap.

Marketing Recommendations for BYD

Enhancing Attitude through Targeted Value Proposition

To strengthen consumer attitudes, BYD should emphasize its technological leadership and environmental credentials. For example, promoting the Blade Battery's safety and energy density and highlighting alignment with China's "dual carbon" goals can reinforce positive product evaluations. Additionally, leveraging government subsidies and tax incentives for NEVs coupled with long-term cost-saving narratives (e.g., reduced fuel and maintenance expenses), can enhance perceived value. Case studies or testimonials from existing users showcasing real-world benefits (e.g., range, charging convenience) would further solidify positive attitudes.

Harnessing Social Influence to Shape Subjective Norms

Given the strong impact of subjective norms, BYD should implement strategies to leverage social influence. This includes Incentivizing existing customers to refer friends and family to create a network effect. BYD can also be partnering with local influencers or celebrities who align with BYD's brand values to endorse products, thereby shaping social expectations. Fostering online and offline user communities where consumers can share experiences, reinforcing positive norms around BYD ownership should be considered.

Improving Perceived Behavioral Control through Accessibility and Transparency

To enhance perceived behavioral control, BYD should focus on collaborating with local governments and businesses to expand charging networks, addressing range anxiety and improving purchase convenience. Offering online configurators, home test drives, and streamlined financing options to reduce decision-making barriers might be a good idea. Enhancing maintenance transparency (e.g., upfront cost estimates, service appointment apps) and responsiveness to build trust in long-term ownership can also be occurred.

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