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Influential Factors Affecting the Attitudes and Purchase Intentions of Post-90s Customers Towards Electric Vehicles in Nanning, China

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Abstract

Purpose: This study investigates the factors influencing consumer attitudes and purchase intentions toward electric vehicles in Nanning. The primary focus is on exploring the causal relationships among perceived usefulness, perceived ease of use, compatibility, personal innovation, environmental awareness, environmental attitude, and behavioral attitude. **Research design, data, and methodology:** This study utilizes quantitative research methods with a sample size of 500 and conducts a questionnaire survey targeting the post-90s population in Nanning City. Non-probability sampling methods are employed, initially utilizing a targeted approach to select participants from three prominent shopping malls in Nanning City. Subsequently, a stratified random sampling method establishes sampling quotas for each mall, enabling data collection online and offline. The analysis involves Structural Equation Modeling (SEM) and Confirmatory Factor Analysis (CFA). **Result:** The research reveals that perceived usefulness, ease of use, compatibility, personal innovation ability, environmental awareness, environmental attitude, and behavioral attitude significantly impact consumer purchase intention. Notably, behavioral attitude emerges as the most influential factor, while compatibility, although the least impactful, still significantly affects consumer purchase intention. **Conclusion:** Managers of new energy vehicle brands can devise tailored strategies based on these evaluations to enhance the attitudes and willingness of post-90s consumers to purchase new electric vehicles.

Keywords : Consumer Attitude, Perceived Ease of Use, Purchase Intention, Environmental Protection, Personal Innovation Ability

JEL Classification Code: I23, J28, L2

1. Introduction

In recent years, there has been a notable surge in interest regarding attitudes and purchase intentions toward electric vehicles. This increased attention is driven by the dynamic shifts and challenges observed in emission pollution and environmental conservation. Recognizing and addressing these challenges has become increasingly crucial for professionals, policymakers, and researchers. Considering this evolving landscape, our study focuses on the nuanced aspects of attitudes and purchase intentions (Guojian & Meihua, 2020). This emphasis is particularly significant due to its far-reaching impact on future development trends, especially in the context of sustainable and eco-friendly transportation.

As technological advancements, globalization, and various other factors reshape the automotive industry, a deeper exploration of attitudes and purchasing intentions becomes essential to unravel the intricacies and implications at play (Ijaz et al., 2011; Kaur & Bhalla, 2010). Understanding how individuals perceive and intend to adopt electric vehicles is paramount in guiding future developments in the transportation sector, aligning with the broader goals of sustainability and environmental responsibility. (Arokiasamy, 2012).

Gago et al. (2014). The Sustainable Development Goals (SDGs), as outlined in the United Nations' 2030 agenda, have become a focal point of interest for scholars and

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policymakers alike. These global objectives provide a comprehensive framework, encouraging a holistic examination of how attitudes and purchase intentions align with the broader goals of sustainable and responsible consumption. In dissecting these dynamics, our study aims to contribute valuable insights that can guide strategies, policies, and practices toward realizing the sustainable future envisioned by the SDGs. The urgency and shared responsibility to address global challenges have become increasingly apparent, with countries worldwide grappling with interconnected issues such as insufficient resources, extreme weather conditions, the spread of diseases, air pollution, and declining economic productivity (Gopi & Ramayah, 2007).

As emphasized in the study by Ha and Janda (2020), greenhouse gas emissions (GHGs) are a pivotal contributor to climate change. Effectively combating environmental health threats, such as climate change, necessitates a critical focus on promoting the Sustainable Development Goals (SDGs). This study underscores the importance of aligning consumer attitudes and purchase intentions with sustainable practices to contribute meaningfully to the global efforts to achieve these crucial objectives.

We can bolster efforts to improve well-being and public health by prioritizing the SDGs. Essentially, concentrating on the SDGs emerges as a vital strategy to tackle climate change and promote enhanced health outcomes (Ha-Brookshire & Yoon, 2012). Utilizing the Sustainable Development Goals framework to address challenges like climate change strengthens global initiatives and contributes to overall well-being, ensuring good health for all. Consumer attitudes and purchase intentions wield significant influence over consumer behavior, exerting a considerable impact on various industries, including the electric vehicle sector. In recent years, China has experienced notable social progress and rapid economic development, leading to increased income for residents and a sharp rise in private car ownership. As of 2020, China's automobile production reached approximately 252.25 million units, with sales totaling around 253.11 million vehicles.

Hooper et al. (2008). These figures indicate a noteworthy trend where the number of vehicles sold slightly surpassed the production figures, suggesting the possibility of a small inventory or stockpile of vehicles from previous years contributing to the variation. This pattern has consistently been maintained at a high level for several years. By the end of 2020, statistics from the Traffic Management Bureau of the Ministry of Public Security revealed 372 million motor vehicles in the country, with 281 million of them being automobiles. This signifies a substantial presence of automobiles on China's roads, reflecting the nation's robust automotive landscape.

While there is extensive research on consumer attitudes and purchase intentions towards electric vehicles (EVs), there is a dearth of studies focusing specifically on the post-90s population in Nanning, China. Previous research has primarily targeted broader demographics or specific age groups, leaving a gap in understanding the factors influencing EV adoption among this particular demographic in this specific geographic location.

The research problem addressed in this study is the lack of comprehensive insight into the causal relationships among perceived usefulness, perceived ease of use, compatibility, personal innovation, environmental awareness, environmental attitude, and behavioral attitude concerning EV adoption among the post-90s population in Nanning, China. By exploring these relationships, the study aims to elucidate the key drivers influencing consumer attitudes and purchase intentions towards EVs within this demographic group, thus filling a critical gap in the existing literature.

2. Literature Review

2.1 Perceived Usefulness

According to Hansla et al. (2008), academic pursuits involve integrating theoretical knowledge with practical application, providing a systematic approach to analyzing and tackling life's challenges. Various research studies emphasize the importance of contentment in academia, underscoring its impact on factors like academic persistence, adaptability to one's surroundings, discipline adherence, and psychological well-being. These findings highlight the crucial role that academic satisfaction plays in shaping individuals' educational journeys and overall life experiences (Hsu et al., 2015).

Hammer (2011) introduces the concept of "Green Perceived Value," which refers to how consumers gauge the advantages of environmentally friendly products or services. This encompasses the perceived benefits linked to choosing eco-friendly options, such as potential cost savings or personal satisfaction. Furthermore, "Green Perceived Usefulness" focuses on how consumers assess the utility of environmentally friendly products or services in meeting their specific needs. This aspect revolves around the effectiveness of these products or services in fulfilling a purpose.

Gray (2019) emphasize that factors such as compatibility, personal innovation ability, environmental awareness, and perception of environmental attitudes significantly impact students' academic performance and purchasing behavior. The question of how to motivate and guide students, as well as the factors influencing their learning motivation, has received limited attention from scholars. While many researchers concentrate on habits, methods, anxiety, or

motivational factors affecting academic performance, there is a gap in analyzing the factors that lead to anxiety or such motivation. Moreover, a consensus has yet to be reached on stimulating students' deep learning (Fam et al., 2019). Accordingly, the researcher indicates a hypothesis:
H1: Perceived usefulness has a significant influence on attitude toward behavior.

2.2 Perceived Ease of Use

Guojian and Meihua (2020) highlight that several factors contribute to forming perceptions regarding ease of use. System characteristics, such as interface design, functionality, and user guidance, play pivotal roles. Additionally, individual differences, including prior experience, technological expertise, and cognitive styles, shape how users perceive the ease with which they can interact with technology (Hair et al., 2017)

Perceived ease of use plays a crucial role in influencing consumer purchasing decisions, particularly in the context of new energy vehicles (NEVs). As the automotive industry undergoes a transformative shift towards sustainable and environmentally friendly alternatives, understanding consumers' perceptions of ease of use becomes essential for the successful adoption of NEVs. (Hamid et al., 2017).

Farrell and Saloner (1985) introduced the concept of Perceived Ease of Use (PEOU), which is pivotal in the technology adoption domain. PEOU captures users' subjective evaluations of how user-friendly a specific system is. Originating from the Technology Acceptance Model (TAM) proposed by Davis in 1989, PEOU has evolved into a crucial determinant for comprehending users' attitudes toward technology. This concept explores the perceived simplicity or complexity associated with interacting with a technological system (Etikan et al., 2016)

Hsu et al. (2015) elaborate on the perceived ease of use within New Energy Vehicles (NEVs), encompassing intuitive interface design, simplified charging processes, and straightforward maintenance. Consumers exhibit a higher likelihood of considering the purchase of an electric vehicle when they perceive it as user-friendly, with features aligning with their technological expectations and lifestyle. The ease of the charging process significantly influences consumers' decisions to purchase NEVs. A well-developed and easily accessible charging infrastructure contributes to a positive perception of ease of use. Concerns related to range anxiety and inconvenience associated with charging can be mitigated through the availability of reliable and convenient charging stations. Perceived ease of use is intricately linked to consumers' comprehension of NEV technology. Educational initiatives aimed at demystifying the complexities of electric vehicles, explaining charging processes, and highlighting the benefits of sustainable transportation play a crucial role in fostering a positive perception. Informed consumers are more likely to view NEVs as user-friendly and make well-informed purchasing decisions (Hambleton, 1978). Accordingly, the researcher indicates a hypothesis:
H2: Perceived ease of use has a significant influence on attitude toward behavior.

2.3 Compatibility

Jackson et al. (2013) conclude that compatibility positively influences consumer willingness to purchase new energy vehicles. Building on this, Chao et al. (2017) highlights a substantial body of literature addressing the relationship between compatibility and consumer purchase intention. In a survey conducted by Butt, five key factors emerged as the most influential in affecting consumer purchase intention. These factors include compatibility, convenience, durability, usage costs, and infrastructure construction.

Jamieson (2004) explores the financial aspects of New Energy Vehicle (NEV) ownership, encompassing factors like purchase costs, operating expenses, and potential savings. The economic compatibility of NEVs with consumers' budgets is emphasized, with considerations for government incentives, reduced operational costs, and long-term financial benefits contributing to overall economic feasibility. (Kline, 2011). The study also delves into how NEV adoption aligns with societal trends, cultural perceptions, and peer influence. NEVs that demonstrate social compatibility, reflecting broader societal values and trends, will likely garner more acceptance. Social factors, including community support and cultural perceptions, play a role in shaping the perceived compatibility of NEVs

Khosrowpour (2008) discusses the integration and interoperability of New Energy Vehicle (NEV) technology with existing infrastructure and charging systems. Consumers actively seek NEVs that seamlessly align with their current technological ecosystems. Ensuring compatibility with charging infrastructure, home charging solutions, and mobile apps for monitoring and control is vital for a smooth ownership experience. The study also explores the alignment of NEVs with consumers' environmental values and concerns. Since sustainability is a key driver for NEV adoption, consumers are inclined towards vehicles that resonate with their environmental consciousness. The compatibility of NEVs with green initiatives and a commitment to reducing carbon footprints enhances their attractiveness. (Kline, 2011). Accordingly, the researcher indicates a hypothesis:
H3: Compatibility has a significant influence on attitude toward behavior.

2.4 Personal Innovativeness

Khan and Yildiz (2020) associate their concept closely with innovation adoption theories, such as Everett Rogers' Diffusion of Innovations theory. These theories categorize individuals into segments like innovators, early adopters, early majority, late majority, and laggards based on their personal innovativeness. Recognizing and comprehending personal innovativeness is vital for marketers, technology developers, and educators, as it enables the tailoring of strategies to effectively reach and engage individuals according to their readiness to adopt new ideas. (Kline, 2015).

Weerasinghe and Fernando (2018) emphasize that in the realm of technology adoption, personal innovativeness plays a crucial role. Individuals with high personal innovativeness are more inclined to embrace and integrate new technologies into their lives. Personal innovativeness is closely linked to specific personality traits, including openness to experience, curiosity, a propensity for risk-taking, and a positive attitude toward change. Innovators, characterized by high personal innovativeness, are typically the earliest adopters of new ideas or technologies, followed by early adopters who also exhibit a substantial degree of personal innovativeness. Several factors can influence personal innovativeness, including education, exposure to diverse experiences, social influence, and the perceived benefits or advantages of adopting innovations. Recognizing and understanding these factors are crucial for comprehending individuals' readiness to adopt new technologies and for tailoring strategies that facilitate effective technology adoption.

Wiers Jensen et al. (2002) delineate personal innovativeness as an individual's predisposition or willingness to adopt and use new ideas, technologies, or practices. This trait plays a pivotal role in determining the speed and eagerness with which an individual embraces innovation. Personal innovativeness is viewed as a personality characteristic influencing one's openness to change and readiness to explore and adopt novel concepts. Defined as an individual's willingness and ability to try out new ideas, products, or technologies, the concept is closely associated with innovation adoption theories such as Everett Rogers' Diffusion of Innovations theory. These theories classify individuals into categories like innovators, early adopters, early majority, late majority, and laggards based on their personal innovativeness. Accordingly, the researcher indicates a hypothesis:

H4: Personal innovativeness has a significant influence on attitude toward behavior.

2.5 Environmental Consciousness

Gamage et al. (2008) highlight the well-documented influence of environmental consciousness on purchase intention in consumer behavior research. Individuals who prioritize environmental considerations are more inclined to assess the ecological impact of products and make purchase decisions aligned with their values. The increasing awareness of environmental issues, such as climate change, pollution, and resource depletion, has heightened consumers' consciousness regarding the ecological footprint associated with their consumption choices (Kakwani & Pothong, 2010). Companies that adopt environmentally friendly practices and demonstrate corporate social responsibility appeal particularly to environmentally conscious consumers. This demographic is more likely to support businesses that are committed to sustainability. Consumers with elevated environmental consciousness are more prone to regard a product's environmental impact as crucial during the decision-making process. Numerous studies have identified a positive correlation between environmental consciousness and purchase intention (Pencarelli et al., 2013).

Goldstein et al. (2002) have extensively documented the impact of environmental consciousness on purchase intention in consumer behavior research. Individuals who prioritize environmental considerations are more inclined to assess the environmental impact of products and make purchase decisions aligned with their values. The increasing awareness of environmental issues, including climate change, pollution, and resource depletion, has heightened consumers' consciousness regarding the ecological footprint associated with their consumption choices (Li, 2019).

Lin and Syrgabayeva (2016) have indicated that environmental consciousness not only affects purchase intention but can also drive broader behavioral changes. Consumers may adopt more sustainable lifestyles, including reducing waste, conserving energy, and choosing products with minimal environmental impact. Younger generations, such as Millennials and Generation Z, often exhibit heightened environmental consciousness, and their values and preferences significantly influence market trends. Businesses are adapting by incorporating sustainable practices to meet the expectations of these environmentally aware consumers. Marzo Navarro et al. (2005) note that environmental consciousness is further reinforced by government initiatives and regulations promoting sustainability. Policies that incentivize eco-friendly practices can contribute to a shift in consumer behavior and purchase intentions (Kaur & Bhalla, 2018). In summary, the impact of environmental consciousness on purchase intention highlights the evolving dynamics of consumer preferences in favor of sustainable and eco-friendly options. As businesses increasingly recognize the importance of environmental responsibility, integrating sustainable practices into products and marketing strategies becomes a key driver of success in the contemporary market. Accordingly, the researcher indicates a hypothesis:

H5: Environmental consciousness has a significant influence on purchase intention.

2.6 Environmental Attitude

Lavrakas (2008) notes that social factors, including peer influence and social norms, can shape positive environmental attitudes. Consumers may adopt environmentally friendly behaviors and purchasing patterns to align with perceived societal expectations and values. Those with positive environmental attitudes often demonstrate a long-term perspective in their decision-making, considering the sustainability and environmental impact of products. This influences their intention to make choices that support a sustainable lifestyle. In conclusion, the substantial influence of environmental attitudes on purchase intention emphasizes the importance of businesses incorporating sustainable practices and communication strategies into their offerings. As consumer awareness and concern for environmental issues continue to grow, fostering positive environmental attitudes can be a key driver of success in the marketplace.

Ibeziakor and Ibekwe (2006) and Kaur, (2010) highlight that the relationship between environmental attitude and purchase intention has been extensively researched in consumer behavior. Environmental attitude, in this context, refers to an individual's overall evaluation and feelings about environmental issues, sustainability, and the significance of ecological considerations in decision-making (O'Driscoll, 2012). Consumers with a positive environmental attitude are more likely to prioritize products and brands that align with their values. The alignment of personal values with environmentally friendly options positively influences purchase intention. Environmental attitudes are closely tied to ethical consumption, where consumers with positive environmental attitudes often exhibit a preference for products that are ethically sourced, sustainably produced, and have minimal negative impact on the environment.

McDonald and Ho (2002) note that green marketing strategies, including eco-friendly branding, labels, and messaging, strongly resonate with consumers possessing positive environmental attitudes. These strategies play a crucial role in shaping consumer perceptions and, consequently, their purchase intentions. Environmental attitudes significantly influence how consumers evaluate products, with those having positive environmental attitudes viewing products with environmentally friendly attributes more favorably. This, in turn, increases the likelihood of purchase (Xu et al., 2018). Consumers with positive environmental attitudes tend to engage in more extensive information processing during purchasing decisions. They actively seek out information about a product's environmental impact, leading to more informed and sustainable choices (MacCallum et al., 1999). Accordingly, the researcher indicates a hypothesis:

H6: Environmental attitude has a significant influence on purchase intention.

2.7 Attitude Toward Behavior

MacCallum et al. (1999) explain that attitude toward behavior comprises both affective (emotional) and cognitive (rational) components. A consumer's emotional response to a product, brand, or the act of making a purchase, along with rational evaluations, collectively shapes their overall attitude.

Davis et al. (1989) elucidate that the Theory of Planned Behavior (TPB) asserts that attitudes toward a behavior significantly impact an individual's intention to engage in that behavior, subsequently influencing actual behavior. This theory finds extensive application in consumer behavior, including purchase intention. Attitude toward behavior, within this framework, refers to an individual's positive or negative evaluation of engaging in a specific behavior. In the context of purchase intention, it involves the consumer's overall assessment of the act of making a purchase (Davis, 1989). The TPB posits that attitudes, subjective norms, and perceived behavioral control collectively influence an individual's intention to perform a behavior, with attitude toward behavior playing a central role in shaping this intention. This attitude is influenced by the perceived consequences associated with the behavior. Consumers consider the positive and negative outcomes in the context of purchasing, such as product benefits, perceived value for money, and overall satisfaction (Desa, 2018).

Attitude toward behavior interacts with subjective norms (perceived social pressure) and perceived behavioral control to collectively shape the overall intention to perform a behavior. In the context of purchase intention, this implies that attitudes, social influences, and perceived control jointly influence decision-making (Malhotra, 2006). Considered a robust predictor of long-term behavior, a positive attitude toward purchasing a particular product or category indicates a sustained intention to make similar purchases in the future. As noted by Müller (2019), the impact of attitude toward behavior on purchase intention is a fundamental aspect of consumer decision-making. Businesses benefit from understanding and positively influencing consumers' attitudes toward their products, enhancing overall purchase intentions and, consequently, driving actual purchasing.

O'Rourke and Hatcher (2013). Positive attitudes toward a behavior, such as purchasing a specific product, play a pivotal role in shaping more favorable evaluations of that product. Consumers with positive attitudes are inclined to view the product positively, increasing the likelihood of purchase intention. External factors, including advertising, word-of-mouth, and product reviews, can influence attitudes

toward behavior. Positive external cues can potentially enhance attitudes and impact purchase intentions. Accordingly, the researcher indicates a hypothesis:
H7: Attitude toward behavior has a significant influence on purchase intention.

2.8 Purchase Intention

Purchase intention, a critical concept in consumer behavior, reflects an individual's inclination or readiness to purchase a particular product or service. Understanding the factors influencing purchase intention is essential for businesses to design effective marketing strategies and enhance overall consumer engagement. Perceived product quality is a fundamental determinant of purchase intention. Consumers often evaluate the perceived quality of a product before forming an intention to purchase. Positive perceptions of quality significantly influence the likelihood of a consumer choosing a particular product (Zeithaml, 1988). Brand reputation plays a pivotal role in shaping purchase intention. Consumers are more likely to make purchases from brands with a positive and trustworthy image. A strong brand reputation significantly influences favorable purchase intentions (Keller, 1993).

The pricing strategy of a product or service impacts consumers' purchase intentions. Consumers assess the perceived value of the price, which significantly influences their decision to purchase (Monroe & Krishnan, 1985).

3. Research Methods and Materials

3.1 Research Framework

The conceptual framework employed in this article integrates insights from the initial three theoretical frameworks. Arroyo and Carrete spearheaded the first theoretical framework in 2019, delving into the associations between perceived usefulness and perceived ease of use, as well as exploring the link between compatibility and personal innovation. The second theoretical framework, proposed by Tu and Yang in 2019, centers around process awareness. The third theoretical framework, put forth by Xu et al. in 2018, focuses on the relationship between environmental attitude (EA) and purchase intention. Figure 1 visually represents the consolidated conceptual framework for this study.

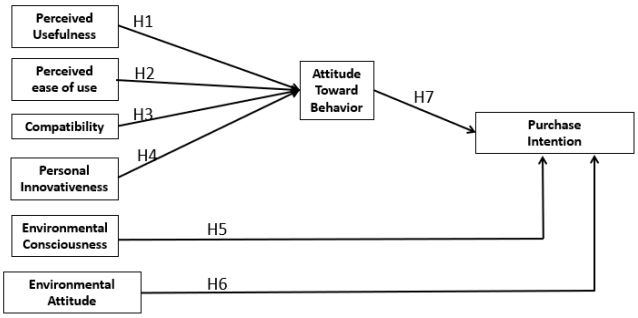

Figure 1: Conceptual Framework

H1: Perceived usefulness has a significant influence on attitude toward behavior.
H2: Perceived ease of use has a significant influence on attitude toward behavior.
H3: Compatibility has a significant influence on attitude toward behavior.
H4: Personal innovativeness has a significant influence on attitude toward behavior.
H5: Environmental consciousness has a significant influence on purchase intention.
H6: Environmental attitude has a significant influence on purchase intention.
H7: Attitude toward behavior has a significant influence on purchase intention.

3.2 Research Methodology

The researcher employed non-probability sampling techniques to distribute questionnaires to the target population, utilizing online platforms and offline paper distribution. The study focused on consumers in Nanning, China, during the 1990s, aiming to gather and analyze factors influencing purchase intention.

Screening questions were initially employed to narrow the survey scope, followed by assessing each independent variable using a five-point Likert scale, ranging from strongly disagree (1) to agree (5). Quantitative methodologies were utilized in this study, incorporating both the project-objective consistency (IOC) test and Cronbach's Alpha test. A panel of three experts evaluated the Index of Item-Objective Congruence (IOC) to ensure the precise alignment of each item with its intended construct, thereby bolstering the validity of the assessment. The pilot test, which involved 50 participants, resulted in a Cronbach's Alpha score exceeding 0.7, confirming the dependable measurement of the designated construct and enhancing the overall reliability of the test outcomes, consistent with the guidelines established by Nunnally and Bernstein (1994).

Subsequently, a questionnaire was distributed to 500 respondents, and all responses were diligently collected.

Statistical analysis was carried out using SPSS and Amos software. To enhance the validity and reliability of the results, Confirmatory Factor Analysis (CFA) was employed to test the data, and Structural Equation Modeling (SEM) was utilized to validate causal relationships between variables.

3.3 Population and Sample Size

This study focuses on examining consumers born in the 1990s in Nanning City, Guangxi Zhuang Autonomous Region, primarily emphasizing three locations: Wanxiang City, Hangyang City, and Qingxiu Wanda. Adhering to the recommendation by Paul et al. (2016) in the literature, which suggests a minimum sample size of 300, the researchers calculated a minimum sample size of 425 based on relevant factor parameters and the number of variables (Rijnsoever et al., 2009). To ensure precision in the calculation, the researchers chose a sample size of 500. 500 questionnaires were distributed, and all of them were successfully collected.

3.4 Sampling Technique

The author adopts nonprobability sampling, purposive sampling to select consumers from Nanning city (1990s), then stratified random sampling to determine the sampling quota for different age groups, and convenience sampling methods to publish online and offline questions to people interested in buying electric vehicles, regardless of location. The distribution ratio is shown in Table 1.

Table 1: Sample Units and Sample Size

Three Main Subjects	Population Size	Proportional Sample Size
Hangyang City	2136	193
Wanxiang City	1987	176
Qingxiu Wanda	1635	131
Total	**5758**	**500**

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

A survey questionnaire was administered to 500 consumers born in the 1990s in Nanning, Guangxi. As depicted in Table 2, the survey sample consists of 469 males and 31 females, constituting 93% and 6.2% of the total, respectively. The surveyed individuals belong to the age group of those born between 1990 and 1999. Occupationally, the sample includes 101 professionals (teachers, doctors, lawyers, etc.), accounting for 20.2%; 50 individuals in the service industry (catering, drivers, etc.), representing 10%; 16 freelancers, making up 3.2%; 72 personnel from public institutions and government, comprising 14.4%; 21 students, constituting 4.2%; and 146 frontline workers, accounting for 29.2%. The remaining 94 respondents include business people and homemakers, constituting 18.8%.

In terms of educational background, 125 respondents have a high school education or below, making up 25%; 146 have a college degree, accounting for 29.2%; 121 are undergraduate students, representing 24.2%; 58 are graduate students, constituting 10%; and 50 hold a doctoral degree or above, making up 10% of the surveyed population.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	469	93.8%
	Female	31	6.2%
When were born	1970's-1979's	0	0%
	1990's -1999's	500	100%
	None of them	0	0%
Occupation	Professionals	101	20.2%
	Service industry personnel	50	10%
	Freelancer	16	3.2%
	Workers	72	14.4%
	Students	21	4.2%
	Public institutions	146	29.2%
	Others (businessmen, housewives)	94	18.8%
Educational level	High school and below	125	25%
	College degree	146	29.2%
	Undergraduate	121	24.2%
	Graduate student	58	11.6%
	Doctor and above	50	10%

4.2 Confirmatory Factor Analysis (CFA)

Marsh et al. (2009) emphasized the primary use of Confirmatory Factor Analysis (CFA) to assess the effectiveness and acceptability of items in the conceptual model. The criteria for adequacy include a factor load greater than 0.5, a p-value less than 0.05, structural reliability surpassing 0.7, and an average variance extracted exceeding 0.5 (Fornell & Larcker, 1981).

Table 3: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived Usefulness (PU)	Tu and Yang (2019)	4	0.867	0.660-0.910	0.871	0.631
Perceived Ease of Use (PEU)	Tu and Yang (2019)	4	0.876	0.724-0.868	0.880	0.648
Compatibility (C)	Tu and Yang (2019)	5	0.872	0.676-0.887	0.877	0.590
Personal Innovativeness （PIN）	Tu and Yang (2019)	4	0.811	0.693-0.780	0.812	0.520
Environmental Consciousness (EC)	Arroyo and Carrete (2019)	4	0.797	0.624-0.760	0.797	0.498
Environmental Attitude (EA)	Xu et al. (2018).	7	0.904	0.709-0.864	0.907	0.583
Attitude toward behavior (ATB)	Tu and Yang (2019)	3	0.878	0.805-0.870	0.880	0.710
Purchase Intention (PI)	Tu and Yang (2019)	4	0.894	0.658-0.930	0.898	0.690

In this research, various goodness-of-fit indices such as chi-square (χ^2/df), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normalized Fit Index (NFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Approximation Error (RMSEA) were employed to evaluate the model's fit.

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	2.325
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.874
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.850
NFI	≥ 0.80 (Wu & Wang, 2006)	0.884
CFI	≥ 0.80 (Bentler, 1990)	0.930
TLI	≥ 0.80 (Sharma et al., 2005)	0.922
RMSEA	< 0.08 (Pedroso et al., 2016)	0.052
Model Summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normalized fit index, CFI = comparative fit index, TLI = Tucker Lewis index, and RMSEA = root mean square error of approximation

Marsh et al. (2020) suggested that satisfactory discriminant validity is achieved if the square root of the average variance extracted is greater than the coefficient of other related structures. As depicted in Table 5, all findings from this study align with the discriminant and convergence validity criteria.

Table 5: Discriminant Validity

	PU	PEU	C	PIN	EC	EA	ATB	PI
PU	**0.794**							
PEU	0.290	**0.805**						
C	0.169	0.225	**0.768**					
PIN	0.157	0.311	0.355	**0.721**				
EC	0.167	0.265	0.241	0.434	**0.706**			
EA	0.153	0.302	0.320	0.377	0.420	**0.764**		
ATB	0.510	0.425	0.317	0.424	0.293	0.262	**0.842**	
PI	0.652	0.364	0.376	0.321	0.449	0.344	0.620	**0.831**

Note: The diagonally listed value is the AVE square roots of the variables
Source: Created by the author.

4.3 Structural Equation Model (SEM)

Carlson and Donavan (2008) utilized Structural Equation Modeling (SEM) to scrutinize the relationships among test variables, ensuring the reliability and validity of the data. Following the recommendations of Ferguson et al. (2007), the acceptability criteria include GFI greater than or equal to 0.85 and AGFI greater than or equal to 0.8. Additionally, NFI, CFI, and TLI values should surpass or equal 0.8, as suggested by Mohammed and Abdullah (2018), Hair et al. (2011), and Pedroso et al. (2016). The Root Mean Square Approximation Error (RMSEA) should be less than or equal to 0.08, as proposed by Peng and Samah (2006).

As illustrated in Table 6, calculations were conducted using Amos version 26 for SEM, and the fitting index results indicate that CMIN/DF=3.081, GFI=0.826, AGFI=0.801, NFI=0.840, CFI=0.886, TLI=0.877, and RMSEA=0.065. These outcomes affirm that the fitting index meets the specified requirements.

Table 6: Goodness of Fit for Structural Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	3.081
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.826
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.801
NFI	≥ 0.80 (Wu & Wang, 2006)	0.840
CFI	≥ 0.80 (Bentler, 1990)	0.886
TLI	≥ 0.80 (Sharma et al., 2005)	0.877
RMSEA	< 0.08 (Pedroso et al., 2016)	0.065
Model Summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normalized fit index, CFI = comparative fit index, TLI = Tucker Lewis index, and RMSEA = root mean square error of approximation

4.4 Research Hypothesis Testing Result

The research model in this article primarily assesses the significance of relationships among its variables by standardizing regression weights and variances. A significance level of $p<0.05$ is considered significant. As indicated in the results presented in Table 7, all seven hypotheses are deemed significant. Among the factors influencing consumer purchase intention, behavioral attitude has the most substantial impact at 0.576, followed by perceived usefulness (β= 0.459), environmental awareness (β= 0.253), personal innovation ability (β= 0.273), and perceived ease of use (β= 0.278). In contrast, compatibility and environmental attitudes exhibit a relatively weaker impact on consumer purchase intention. The details are outlined in Table 7.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-value	Result
H1: PU→ATB	0.459	9.310*	Supported
H2: PEU→ATB	0.248	5.570*	Supported
H3: C→ATB	0.170	3.915*	Supported
H4: PIN→ATB	0.273	5.713*	Supported
H5: EC→PI	0.253	5.497*	Supported
H6: EA→PI	0.120	2.956*	Supported
H7: ATB→PI	0.576	12.297*	Supported

Note: * p<0.05
Source: Created by the author

The results in Table 7 can be further refined:

H1 suggests that perceived usefulness significantly influences consumer purchase intention, with a standard coefficient value of 0.459. Consistent with the findings of Martins et al. (2021), perceived usefulness positively impacts consumer satisfaction and willingness to purchase new energy vehicles. In the Nanning City area, companies in the new energy vehicle sector should focus on improving the perceived usefulness and perception of new energy vehicles. Creating a favorable and convenient usage environment encourages consumers' acceptance and willingness to purchase.

H2 suggests that perceived ease of use significantly influences consumer purchasing, with a standard coefficient value of 0.248. Aligned with the observations of Eberhard and Tarpenning (2006), the ease of use associated with new energy vehicles has a notable impact on consumer purchase intention. Enhancing the convenience and user-friendliness of new energy vehicle operations is crucial. This improvement can increase consumer favorability and willingness to adopt new energy vehicles, enhancing overall consumer satisfaction with electric vehicles.

H3 suggests compatibility is a significant factor influencing consumer purchases of new energy vehicles, with a standard coefficient value of 0.170. In line with the findings of Ortar and Ryghaug (2019), it is concluded that system compatibility positively impacts consumer purchase intention. To enhance this aspect, reinforcing the construction of automotive information and entertainment systems and intelligent facilities becomes crucial. This improvement increases the likelihood and stability of consumers choosing new energy vehicles. A more integrated usage environment is created by enhancing compatibility and fostering connections with consumers. This, in turn, substantially increases consumer selectivity and overall satisfaction.

H4 suggests that individual innovation ability is a significant but less influential factor affecting consumer purchase intention, with a standard coefficient value of 0.273. By the findings of Wang et al. (2017), it is emphasized that individual innovation ability positively impacts consumer purchase intention. It is imperative to establish a strong connection between personal innovation ability and purchase intention to encourage consumers to purchase new energy vehicles and enhance their overall recognition of such vehicles. By doing so, consumer willingness to purchase can be increased, subsequently improving their overall attitude toward purchasing new energy vehicles.

H5 suggests that environmental awareness is a crucial factor influencing consumers' decisions to purchase new energy vehicles, with a standard coefficient value of 0.253. Karlsson (2017) asserts that a significant relationship exists between environmental awareness and purchase intention. This is evident in the context that consumers with positive environmental awareness are more inclined to not only make a purchase but also continue using and recommend new energy vehicles to those around them. Positive environmental consciousness significantly contributes to shaping consumer preferences and choices in favor of eco-friendly options.

H6 suggests that environmental attitude significantly influences consumer purchase intention, with a standard coefficient value of 0.120. Jensen and Mabit (2017) contend that a crucial relationship exists between environmental attitudes and purchase intention. In environments characterized by a heightened awareness of environmental attitudes, consumers are more inclined to purchase new energy vehicles. Furthermore, they are more likely to continue identifying with environmental attitudes and recommend such choices to individuals in their social circles. This underscores the impact of positive environmental attitudes in shaping consumer preferences and encouraging the adoption of environmentally friendly options like new energy vehicles.

H7 suggests that behavioral attitude is a crucial factor influencing consumer purchase intention, with a standard coefficient of 0.576. Simsekoglu (2018) asserts that attitude toward behavior potently predicts long-term behavior. A positive attitude toward purchasing a specific product or category indicates a sustained willingness to make similar purchases in the future. Emotionally and rationally driven, a positive attitude toward purchasing behavior plays a pivotal role in shaping purchase intentions. This underscores the importance of cultivating positive consumer attitudes toward purchasing, as it significantly contributes to long-term consumer behavior patterns.

5. Conclusion and Recommendation

5.1 Conclusion

This article mainly studies the factors that affect the willingness of post-90s consumers in Nanning, Guangxi, to purchase new energy vehicles. The framework of this paper is mainly to study the causal relationship between Perceived usefulness (PU), Perceived ease of use (PEU), Compatibility (C), Personal Innovativeness (PI), Environmental consciousness (EC), Environmental attitude (EA) and Attitude toward behavior (ATB). This paper mainly uses a quantitative research method (N=500) for consumers born in the 1990s in Nanning, Guangxi. According to the obtained data, analyze, analyze, and discuss the factors that affect the purchasing intention of consumers born in the 1990s. CFA is mainly used to detect whether the items in the conceptual model are effective or acceptable, and SEM is mainly used to analyze the relationship between the influence of the test variables. The factors influencing students' satisfaction and loyalty are analyzed.

The research results of this article are as follows. Firstly, behavioral attitudes have the greatest impact on consumer purchasing factors. Environmental attitudes have a secondary impact on consumer purchasing factors, and the complexity of perceived usefulness will directly affect the determining factors of consumer purchasing intention. Perceived ease of use and compatibility also significantly impact consumer purchase intention. The positive Attitude of good environmental awareness, good personal innovation ability, and sound policies will guide consumers and actively promote the purchasing willingness and Attitude of post-90s consumers. This helps to save carbon emissions, reduce environmental pollution, promote the development of human carbon emissions on a global scale, and set a correct example for the reproduction of future generations (Yusoff et al., 2015). The environmental Attitude of post-90s consumers towards new energy vehicles will directly affect their willingness to purchase. Consumers with higher environmental awareness or attitudes are more likely to introduce and recommend the new energy vehicles they purchase to others and are also more likely to give back.

5.2 Recommendation

In this study, compatibility, perceived usefulness, environmental awareness, environmental attitude, personal innovation ability, perceived ease of use, and behavioral attitude significantly impact consumer purchase intention. Therefore, good behavioral attitudes can create stronger consumer purchasing intentions, thereby improving their personal innovation ability and environmental attitudes. Strengthening the compatibility construction of new energy vehicles can give consumers a good usage scenario and a popularization environment. In addition, it can enhance consumers' sense of pleasure and experience (Annamdevula & Bellamkonda, 2016). When considering consumer purchasing intentions, new energy vehicle manufacturers should improve the compatibility of new energy vehicles, make it easier for consumers to get started, establish a comprehensive management system for new energy vehicles, and pay more attention to the innovative development needs of new energy vehicles themselves (Nadiri et al., 2009). We should pay attention to the various needs of consumers and make solving their problems the main issue. Establish awareness of serving consumers.

5.3 Limitation and Further Study

This study has some limitations. Firstly, this study surveyed consumers in some shopping malls in Nanning, Guangxi, but only covered some consumers in Nanning, Guangxi. Therefore, there may be errors in the data. Further research can target consumers from different supermarkets. Similarly, this study only considered the relevant influencing factors in the conceptual framework without mentioning whether other factors would affect consumer behavior attitudes and purchase intentions. Further research can be conducted on factors such as environmental supporting facilities, brand influence, and government manufacturer subsidies. Finally, this study only considers local consumers and regional and cultural differences may also affect the results of the analysis.

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