DETERMINANTS OF ATTITUDE AND PURCHASE INTENTIONS REGARDING ELECTRIC VEHICLES AMONG CONSUMERS IN SHANGHAI, CHINA

Pan Zhiming

Guangxi Minzu University, China

e-mail: 260112167@qq.com

Abstract

This research aims to determine the factors influencing the attitude and purchase intentions of Chinese consumers towards electric vehicles in Shanghai, China. This study adopts quantitative analysis of the electric vehicle flagship stores in three of Shanghai's most famous shopping plazas. The sampling method includes judgmental, quota and convenience Sampling. The item-objective congruence index and Cronbach's alpha were assessed in a pilot study (n = 30) to evaluate validity and reliability. The Structural Equation Model (SEM) and Confirmatory Factor Analysis were used for the data analysis, including model fit, reliability, and validity of the constructs. The results explicated that environmental concerns, knowledge, stereotypes, and price sensitivity significantly impact consumers' attitudes toward electric vehicles and purchase intention in Shanghai, China. In conclusion, it is recommended that businesses and managers understand consumers' accurate intentions to increase consumers' attitudes and purchase intentions toward electric vehicles.

Keywords: Knowledge, Environmental Concerns, Attitude, Purchase Intention, Electric Vehicle

Introduction

In recent years, with the rapid development of social progress and economy, the growth of Chinese residents' income and urbanization have been accelerating, and the rapid development of China's automobile industry has led to a sharp rise in the demand for private car purchases. According to the statistics of the China Association of Automobile Manufacturers, in 2020, China's cumulative automobile production and sales reached 25.225 million and 25.311 million, respectively, maintaining high operations for many years. By the end of 2020, the number of motor vehicles in China had reached 372 million, including 281 million vehicles (Guojian & Meihua, 2020).

Although the widespread use of vehicles has brought many conveniences to people's production and life, it should not be ignored that the rapid growth of car ownership has also triggered concerns about a series of issues, such as energy security, climate change, and air pollution (Guojian & Meihua, 2020). It is well known that traffic is largely based on fossil fuels, the department of Transportation oil consumption accounts for more than 50% of total global oil consumption, and according to OPEC, this proportion will jump to 64.9% in 2040, the traditional internal combustion engine car ownership is mainly to the rise in oil consumption road transport industry Factors.

In fact, as a low-carbon technology product, electric vehicles have the characteristics of breakthrough innovation. Consumers should view electric vehicles with the attitude of supporting energy conservation and environmental protection and increase their willingness to buy electric vehicles. According to Rogers's (2003) innovation diffusion theory, Electric vehicles are still in the "early adoption stage" of market diffusion (Liu et al., 2015). At this stage, consumer acceptance is crucial for the continued success of sustainable transport (Shalender & Sharma, 2021). Because the success of an emerging technology product depends on customers' attitudes and purchase intentions, the low market share of electric vehicles in China is related to the low purchase intention of individuals (Suki, 2016).

In summary, some members of the public do not know much about the knowledge of electric vehicle. The attitude of consumers is relatively vague (Sirgy et al., 1991). Some of the publics are interested in Electric Vehicle but skeptical (Topolšek et al., 2020). Especially in the field of private purchase, public cognition and acceptance are relatively low, especially in private purchase (Hawkes et al., 2017), making consumers less willing to buy electric vehicles (Guojian & Meihua, 2020), which greatly affects the early diffusion speed of electric vehicles in the market.

Literature Review

1. Environmental Concern

Environmental concern refers to people's support and recognition of ecological problems in daily life and work, mainly in the daily solution of ecological environment

(Nelson, 2002). Paul et al. (2016) indicated environmental concern means that a person actively participates in environmental protection actions and is willing to contribute to environmental protection. Dunlap and Jones (2002) defined the degree to which human beings encounter problems related to the environment, propose solutions to these problems and are willing to make personal contributions to solving these problems. Environmental problems are defined as the self-evaluation of facts by themselves and others and their attitude and behavior towards the environment (Franssonn & Garling, 1999). Kim and Choi (2005) refer consumers' cognition of the environment and their subjective emotions. Environmental concern refers to the extent to which people are willing to admit that the ecological environment is affected and support the solution of ecological and environmental problems (McCright et al., 2014). Thus, a hypothesis is proposed:

H1: Environmental concern has a significant influence on attitude.

2. Knowledge

Claiborne and Sirgy (1990) stated that consumers' knowledge of products is based on consumers' known knowledge or memory of products. Farah (2014) asserted that consumers' knowledge of products depends on their cognition of products or understanding of products themselves, or their confidence in products. Berliner et al. (2019) indicated the main obstacle to the less adoption of electric vehicles is the lack of technical knowledge of consumers. Consumers have insufficient knowledge of electric vehicles, which may lead them to make cognitive decisions about their preferences for this vehicle (Graham-Rowe et al., 2012). Thus, a hypothesis is proposed:

H2: Knowledge has a significant influence on attitude.

3. Subjective Norm

Ajzen (1991) reflects Subjective Norms (SN) the individual's impression of other's feelings about performing the behavior. Subjective norm can also be referred to as social pressure, or social norm, is presented as the "rules and standards that are understood by members of a group and that guide and/or constrain human behavior without the force of laws" (Ajzen, 2012). Chen and Chai (2010) indicated that Subjective norms can be regarded as the social pressure individuals feel about whether to take a specific behavior, requiring them to perform or not to perform certain actions. Based on normative beliefs and behavior and control beliefs, they constitute significant belief actions that determine a person's intention and behavior. Thus, a hypothesis is proposed:

H3: Subjective norm has a significant influence on attitude.

4. Stereotype

The term stereotype was first introduced by Walter Lippmann (1922). Patterson (1991) indicated stereotype is a common belief. These ideas are usually too simple, exaggerated, inaccurate and incomplete. Stereotypes can develop explicitly (e.g., through conscious observation and then attributing characteristics to all members of a group) or

implicitly (unconsciously), and no one is aware of holding stereotypes (Greenwald & Banaji, 1995). Stereotype is any idea widely adopted about a specific type of individuals or certain ways of behavior, and is intended to represent the whole group of these individuals or behaviors (Dodds et al., 2011). Fiske et al. (1999) indicated that stereotype is considered the most important cognitive component and often occurs without consciousness. Thus, a hypothesis is proposed:

H4: Stereotype has a significant influence on attitude.

5. Price Sensitivity

Suki (2016) defined price sensitivity as the degree of consumer self-awareness and how consumers react when they see a price difference in a product or service. Price sensitivity is the degree to which consumers accept price increases as the economic and psychological benefits of a given product (Anderson, 1996). Ajzen (1985) clarified that price sensitivity refers to the elasticity function of customer demand, that is, the change in product demand caused by price changes. Yang et al. (2017) pointed out that price sensitivity refers to the market being highly dynamic and uncertainty of the price change in consumption caused by intrinsic psychological effect and research the price of consumer consumption psychology to understand the influence factors of consumer price sensitivity, can make the enterprise grasp more initiative in marketing activities, also has more practical meaning. Thus, a hypothesis is proposed:

H5: Price sensitivity has a significant influence on purchase intention.

6. Perceived Behavioral Control

Ajzen (1991) put forward the concept of personal self-belief that has an impact on intention. This concept was later called perceptual behavior control. It refers to personal beliefs about an individual's ability to perform (Brouwer et al., 2009). Francis et al. (2004) stated perceptual behavior control is the concept of individual behavior and the ability of an individual to control his actual behavior, that is, to perform or not to perform conversion actions, which depends on his ability. Bodker et al. (2009) described perceived behavioral control as people's perceptions of their ability to perform a given behavior. Ajzen (1985) clarified that perceived behavioral control refers to how easily or difficult an individual perceives performing a particular behavior, which reflects the individual's perception of factors that promote or hinder the execution of the behavior. Thus, a hypothesis is proposed:

H6: Perceived behavioral control has a significant influence on purchase intention.

7. Attitude

Ajzen (1991) defines attitude as an individual's attitude towards a specific kind of behavior that will help them achieve their desired goals, such as convenience, environmental problems, and interests. Attitude is mainly divided into two areas; one is perception, and the other is belief and emotion (Engel et al., 1995). On the other hand, Fishbein and Ajzen (1975) divided attitudes into multidimensional structures: cognition, emotion, and idea. Cognitive

structure refers to the knowledge structure in people's minds, such as the knowledge of products or services. Emotional construction refers to people's preference for specific topics, such as feeling, emotion, and evaluation. Conceptual structure refers to behavioral intention, such as purchase intention, cognitive response, and action response. Eagly and Chaiken (2020) defined attitude as a psychological path in which an individual expresses likes or dislikes for a specific object. Thus, a hypothesis is proposed:

H7: Attitude has a significant influence on purchase intention.

2.8. Purchase Intention

Purchase intention is an important index to forecast consumer behavior, defined as a consumer's subjective tendency toward a particular product. Purchase intention is the predictor of future purchase decisions, as mentioned by Warshaw (1980). Purchase intention is defined as a consumer's demand for a product soon, the potential for their likely requirement to purchase, or their preparedness to dedicate to the purchase of a particular product (Wang et al., 2019). Purchase intention refers to a consumer tendency to purchase the product in the future and resist switching to other brands (Wu et al., 2011). Purchase intentions are personal action tendencies relating to the product (Bagozzi et al., 1979).

Research Framework

The conceptual framework is developed from studying previous research frameworks. It is adapted from three theoretical models. Firstly, Ajzen (1991) studied the Theory of Planned Behavior. Secondly, the study of Dash (2021) verified that product knowledge and environmental problems have greatly affected consumers' attitudes towards electric vehicles. The third research was explored by Bennett and Vijaygopal (2018), which investigated consumer attitudes towards electric vehicles. Effects of product user stereotypes and self-image congruence. The conceptual framework of this study is proposed in Figure1.
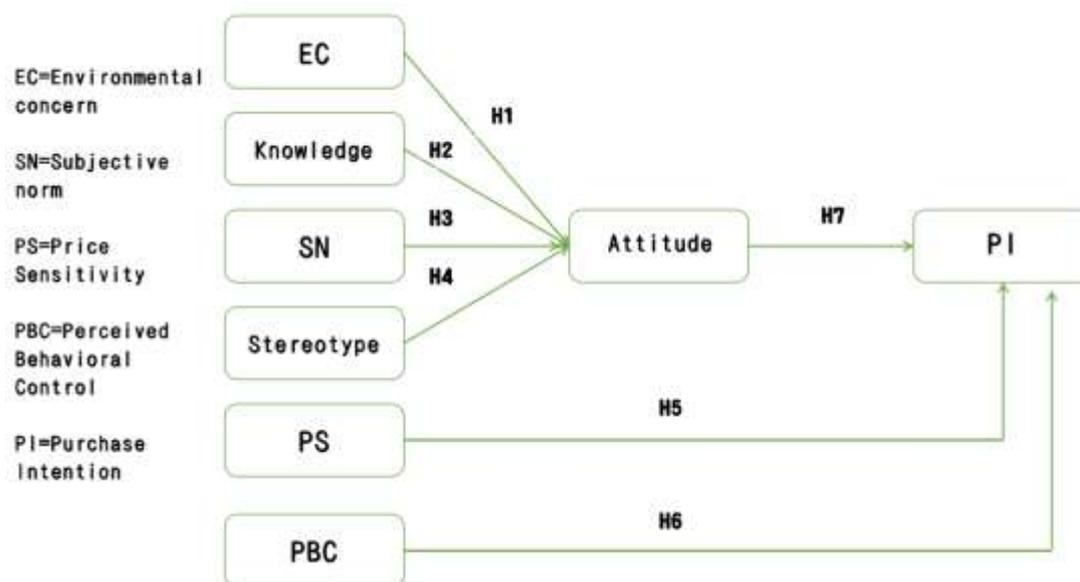
Figure 1 Conceptual Framework

The hypotheses of the research variables based on the conceptual framework are;

H1: Environmental concern has a significant influence on attitude.

H2: Knowledge has a significant influence on attitude.

H3: Subjective norm has a significant influence on attitude.

H4: Stereotype has a significant influence on attitude.

H5: Price sensitivity has a significant influence on purchase intention.

H6: Perceived behavioral control has a significant influence on purchase intention.

H7: Attitude has a significant influence on purchase intention.

Research Methodology

This study adopts quantitative analysis. The researchers collected the raw data in the most crowded areas, three shopping malls, and plazas in Shanghai. The descriptive research method is another method used in this study. Cooper and Schindler (2014) pointed out that descriptive research is mainly carried out through statistical methods represented by various data, such as mean and percentage, to reveal better the relationship between the total number of single factors. The researcher also applied the format of questionnaires with the Likert scale. The response categories in the Likert scales have a rank order, but the intervals between values cannot be presumed equal. Pilot testing was conducted for an expert rating of the item-objective congruence (IOC) index and 30 respondents. Cronbach's Alpha approach was used for validity and reliability testing. 500 accepted responses were collected and analyzed using SPSS AMOS 25.0. Confirmatory Factor Analysis (CFA) was used to test convergence accuracy and validation. The structural Equation Model (SEM) was used to examine the effect of variables.

1. Population and Sample Size

This study's target group is consumers over 18 without experience purchasing electric vehicles in Shanghai, China. Hair et al. (2016) described that most sample sizes can rely on previous research for a valid population. Thus, the researcher selected three previous studies to define the sample size and applied them. Based on previous research, in order to get an acceptable sample size for reliability, the researcher decided to collect 500 respondents as a sample size in this study.

2. Sampling Techniques

The sampling method includes Judgmental or purposive sampling, Quota Sampling, and Convenience Sampling. The researchers will select three shopping plazas in Shanghai, China, where Electric Vehicle's flagship stores are located, for a judgment sampling program to collect questionnaires. The researchers used quota sampling methods to distribute questionnaires to the three locations and collected data from 500 respondents.

Results and Discussion

1. Demographic Information

The profile of the demographic targets 500 participants, which is concluded in Table 1. Male respondents represent 61.8%, and female respondents account for 38.2%. For the age group, the biggest segment in this research was 29-39 years old, representing 36.0% of respondents, 30.2% of 40-50 years old, 19.4% of more than 50 years old, and 14.4 % of 18-28 years old. According to the income, 10,001CNY-20,000CNY for 40.4, 20,001CNY or more for 28%, 5,001CNY-10,000CNY for 21.4%, and 5,000CNY or less for 10.2%. In terms of the educational background of respondents, the major group was a Bachelor's degree of 42.8%. In contrast, a Master's degree accounted for 34.4%, a doctor's degree or above 12%, and a high school level 10.8% respectively. In terms of the Employment category, the management of 24.6%, the government and others of 20.4%, Employee of 13%, self-employed of 11%, student of 10.6%.

Table 1 Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	309	61.8%
	Female	191	38.2%
Age	18-28years old	72	14.4%
	29-39years old	180	36%
	40-50 years old	151	30.2%
	More than 50	97	19.4%
Income	5,000 CNY or less	51	10.2%
	5,001-10,000 CNY	107	21.4%
	10,001-20,000 CNY	202	40.4%
	20,001 CNY or more	140	28%
Education	High School Level	54	10.8%
	Bachelor Degree	214	42.8%
	Master Degree	172	34.4%
	Doctor Degree or above	60	12%
Employment category	Student	53	10.6%
	Employee	65	13%
	Management	123	24.6%
	Government	102	20.4%
	Self-employed	55	11%
	Other	102	20.4%

2. Confirmatory Factor Analysis (CFA)

In this study, Confirmatory Factor Analysis (CFA) was used to assess the validity of the measures. Results indicated that all items within each variable had significant factor loadings, demonstrating discriminant validity. The goodness of fit was evaluated based on the significance of factor loadings and acceptable values (Hair et al., 2010). Factor loadings were considered acceptable if they exceeded 0.30 and had a p-value below 0.05.

Table 2 Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance
Extracted (AVE)

Variables	Source of Questionnaire	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Environmental Concern (EC)	McCright et al. (2014)	4	0.790	0.663-0.745	0.792	0.488
Knowledge (KNO)	Kim and Choi (2005)	4	0.817	0.696-0.743	0.818	0.529
Subjective Norm (SN)	Ajzen (2012)	4	0.852	0.742-0.787	0.853	0.592
Stereotype (ST)	Fiske et al. (1999)	4	0.817	0.722-0.733	0.818	0.529
Price Sensitivity (PS)	Mishra and Malhotra (2019)	4	0.805	0.688-0.736	0.806	0.509
Perceived Behavioral Control (PBC)	Francis et al. (2004)	4	0.805	0.671-0.761	0.807	0.512
Attitude (ATT)	Fishbein and Ajzen (1975)	4	0.823	0.720-0.745	0.823	0.538
Purchase Intention (PI)	Wu et al. (2011)	4	0.820	0.708-0.759	0.821	0.535

Source: Created by the author.

The construct reliability was greater than the recommended cutoff value of 0.7. The average variance extracted exceeded the recommended cutoff value 0.5 (Fornell & Larcker, 1981), as shown in Table 2. All estimates were found to be significant.

Table 3 Goodness of Fit for Measurement Model

Index	Acceptable Values	Statistical Values After Adjustment
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	1.153
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.942
AGFI	≥0.80 (Sica & Ghisi, 2007)	0.930
NFI	≥ 0.80 (Wu & Wang, 2006)	0.948
CFI	≥0.80 (Bentler, 1990)	0.993
TLI	≥0.80 (Sharma et al., 2005)	0.992
RMSEA	< 0.08 (Pedroso et al., 2016)	0.017
Model summary		Acceptable Model Fit

Note: 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 = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, RMSEA = Root mean square error of approximation.

The goodness-of-fit indices' receivable value showed the model fit in Table 3. The statistical values of indices were compared with acceptable criteria: the value of CMIN/DF=1.153, GFI=0.942, AGFI=0.930, NFI=0.948, CFI=0.993, TLI=0.992, RMSEA=0.017.

Table 4 Discriminant Validity

	EC	KNO	SN	ST	PS	PBC	ATT	PI
EC	**0.792**							
KNO	0.389	**0.805**						
SN	0.194	0.274	**0.817**					
ST	0.412	0.287	0.211	**0.776**				
PS	0.362	0.28	0.225	0.292	**0.796**			
PBC	0.367	0.385	0.203	0.35	0.409	**0.795**		
ATT	0.464	0.404	0.208	0.381	0.467	0.439	**0.819**	
PI	0.492	0.524	0.395	0.483	0.476	0.532	0.548	**0.828**

Note: The diagonally listed value is the AVE square roots of the variable

In Table 4, it was shown that all the relationships exceeded any interrelated coefficient for the variables with the square root of average variance extracted.

3. Structural Equation Model (SEM)

Hair et al. (2010) state that Structural Equation Modeling (SEM) validates the causal relationship among variables in a proposed model and encompasses measurement inaccuracy in the structure coefficient. The goodness of fit indices for the Structural Equation Model (SEM) is measured as demonstrated in Table 6. The model fit measurement should not be over 3 for the Chi-square/degrees-of-freedom (CMIN/DF) ratio, and GFI and CFI should be higher than 0.8, as Greenspoon and Saklofske (1998) recommended. The calculation in SEMs and adjusting the model by using SPSS AMOS version 25, the results of the fit index were presented as a good fit, which are CMIN/DF = 2.298, GFI =0.865, AGFI = 0.844, NFI = 0.891, CFI = 0.935, TLI =0.929 and RMSEA = 0.051, according to the acceptable values are mentioned in Table 6.

Table 6 Goodness of Fit for Measurement and Structural Model

Index	Acceptable Criterion	Statistical Values
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	2.298
GFI	$\geq$ 0.85 (Sica & Ghisi, 2007)	0.865
AGFI	$\geq$0.80 (Sica & Ghisi, 2007)	0.844
NFI	$\geq$ 0.80 (Wu & Wang, 2006)	0.891
CFI	$\geq$0.80 (Bentler, 1990)	0.935
TLI	$\geq$0.80 (Sharma et al., 2005)	0.929
RMSEA	< 0.08 (Pedroso et al., 2016)	0.051
M o d e l Summary		Acceptable Model Fit

Note: 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 = Normed fit index, RMSEA = Root mean square error of approximation CFI = Comparative fit index, and TLI = Tucker-Lewis index

4. Hypothesis Testing Result

Research hypothesis testing and results were determined by standardized path coefficient (β) and t-value of the SEM. In Table 6, most of the hypotheses were significant at a p-value less than 0.5, except H3 of the relationship between subjective norm and attitude

Table 6 Hypothesis Results of the Structural Equation Model

ypothesis	(β)	t-Value	Result
H1: EC⟶ATT	0.323	6.586*	Supported
H2: KNO⟶ATT	0.265	5.521*	Supported
H3: SN⟶ATT	0.080	1.726	Unsupported
H4: ST⟶ATT	0.225	4.667*	Supported
H5: PS⟶PI	0.229	4.990*	Supported
H6: PBC⟶PI	0.340	7.155*	Supported
H7: ATT⟶PI	0.389	8.041*	Supported

Note: * $p < 0.05$

Source: Created by the author.

The result of H1 supported the hypothesis of a significant relationship between Environmental concern and Attitude, as described by the standard coefficient value of 0.323. H2, the analysis's outcome, supported the hypothesis of the significant influence of knowledge on Attitude, representing the standard coefficient value of 0.265. The study of Ackaah et al. (2022) showed that knowledge affects residents' attitudes toward green product purchase behavior. Based on the results of H3, this study's statistical findings do not support the hypothesis that subjective norms have a significant impact on Attitude, with the standard coefficient value of 0.080. H4 has proven that stereotype is one of the key drivers of Attitude, revealing the standard coefficient value of 0.225 in the structural pathway. According to Bennett and Vijaygopal (2018), stereotype influence significantly affects consumer attitudes. H5, the outcome of the analysis supported the hypothesis of the significant influence of price sensitivity on purchase Intention, representing the standard coefficient value of 0.229. Price sensitivity has a significant impact on consumers' purchase intention (Bhutto et al., 2022). H6 showed that perceived behavioral control significantly influenced purchase intention, as indicated by the common coefficient value of 0.340. Therefore, consumers' perceived behavioral control affects purchase intention (Jaiswal et al., 2022). With a standardized path coefficient value of 0.389, H7 confirmed that Attitude is one of the most important determinants of purchase intention. According to Yang et al. (2017), the study indicates a positive relationship between attitude and purchase intention.

Conclusions, Recommendations, Limitations and Future Research

　　1. Conclusions

　　This study examines the factors influencing consumers' attitudes and purchase intentions toward electric vehicles in Shanghai, China. These hypotheses are proposed as a

conceptual framework to study how environmental concerns, Knowledge, subjective norms, stereotypes, price sensitivity, and perceived behavioral control significantly influence consumer attitudes and purchase intentions. The questionnaire was conducted in three shopping malls with the largest flow of people and the most developed commerce in Shanghai, China. Confirmatory Factor Analysis (CFA) was carried out to measure and test the validity and reliability of the conceptual model. Hence, the influential factors that impact attitude and purchase intention were analyzed using the Structural Equation Model (SEM).

The research described the findings as follows. First, attitude has the most significant impact on purchase intentions. Egbue and Long (2012) also analyze whether consumers choose electric vehicles and find a close relationship between attitude towards products and purchase intention. Secondly, perceived behavioral control versus attitude is the second level of the score. This also proves that individual control over their behavior affects consumers' attitudes towards electric vehicles. Third, environmental concerns have been shown to significantly impact attitudes towards purchasing electric vehicles. Ducoffe (1996) defined environmental concern as people's awareness of environmental problems and taking actions to care for the environment to promote the development of environmental protection. This also shows that people are paying more and more attention to environmental protection. Fourth, Knowledge has a significant impact on attitudes. Consumers' Knowledge of electric vehicles is insufficient, which may lead them to make cognitive decisions about their preferences for this vehicle (Graham-Rowe et al., 2012). Fifth, Price sensitivity significantly affects purchase intention. This can indirectly prove that if the price of electric vehicles exceeds the affordable range of consumers, it will discourage consumers.

2. Recommendations

Researchers found that environmental concerns, knowledge, stereotypes, and price sensitivity affect consumer attitudes and purchase intentions in Shanghai, China. Therefore, it is recommended that managers should take consumers' needs for these aspects into consideration when positioning and selling products to achieve revenue generation. In terms of literature and practical significance, management and relevant sales personnel must start from consumers' attitudes and purchasing intentions, popularize knowledge about carbon peaking and carbon integration to consumers in terms of current environmental concerns, and change consumers' attitudes toward traditional fuels, the relevant knowledge of electric vehicles is popularized, and the use methods of electric vehicles are popularized in terms of product coefficients, cruising range, and charging services so that consumers can understand the relevant knowledge of electric vehicles. Concept of automobiles while conducting moderate subsidies and promotions for electric vehicles. In addition, managers can also conduct regular return visits to customers to collect feedback on the use of electric vehicles, thereby improving consumer satisfaction. All in all, the research results are helpful for

companies to understand consumers' accurate intentions and adjust business strategies on time.

3. Limitations and Future Research

The limitation of this study is that it is possible to obtain different analysis results when investigating shopping malls in different countries, regions, or sizes; further research can study factors that may affect consumer attitudes and purchase intentions, such as national policies, merchant promotions, consumer behavior habits, etc. In addition, future research can also be extended to the impact of the improvement of electric vehicle charging piles, such as the city's charging pile supporting facilities and preferential policies on electricity charges.

Reference

Ackaah, W., Kanton, A. T., & Osei, K. K. (2022). Factors influencing consumers' intentions to purchase electric vehicles in Ghana. *Transportation Letters*, *14*(9), 1031-1042. Retrieve from https://doi.org/10.1080/19427867.2021.1990828

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In I. Ajzen (Ed.), *Action control: From cognition to behavior* (pp. 11-39). Springer

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. Retrieve from https://doi.org/10.1016/0749-5978(91)90020-t

Ajzen, I. (2012). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology, 32*(4), 665-683. Retrieve from https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Al-Mamary, Y. H., & Shamsuddin, A. (2015). Testing of the Technology Acceptance Model in Context of Yemen. *Mediterranean Journal of Social Sciences, 2*(1), 11-23. Retrieve from https://doi.org/10.5901/mjss.2015.v6n4s1p268

Anderson, J. R. (1996). ACT: A simple theory of complex cognition. *American psychologist*, *51*(4), 355- 365. Retrieve from https://doi.org/10.1037//0003-066x.51.4.355

Awang, Z. (2012). *Structural equation modeling using AMOS graphic* (1st ed.). Penerbit Universiti Teknologi MARA.

Bagozzi, R. P., Tybout, A. M., & Craig, S. (1979). The Construct Validity of the Tripartite Classification of Attitudes. *Journal of Marketing Research, 16,* 88-95. Retrieve from https://doi.org/10.1177/002224377901600113

Bennett, R., & Vijaygopal, R. (2018). Consumer attitudes towards electric vehicles: Effects of product user stereotypes and self-image congruence. *European Journal of Marketing, 52*(3/4), 499-527. Retrieve from https://doi.org/10.1108/ejm-09-20160538

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238-246. Retrieve from https://doi.org/10.1037//0033-2909.107.2.238

Berliner, R. M., Hardman, S., & Tal, G. (2019). Uncovering early adopter's perceptions and purchase intentions of automated vehicles: Insights from early adopters of electric vehicles in California. *Transportation Research Part F: Traffic Psychology and Behavior, 60*, 712-722. Retrieve from https://doi.org/10.1016/j.trf.2018.11.010

Bhutto, M. H., Tariq, B., Azhar, S., Ahmed, K., Khuwaja, F. M., & Han, H. (2022). Predicting consumer purchase intention toward hybrid vehicles: testing the moderating role of price sensitivity. *European Business Review, 34*(1), 62-84. Retrieve from https://doi.org/10.1108/ebr-10-2019-0274

Bodker, K., Kensing, F., & Simonsen, J. (2009). *Participatory IT design: designing for business and workplace realities*. MIT press.

Brouwer, S., Krol, B., Reneman, M. F., Bültmann, U., Franche, R.-L., van der Klink, J. J. L., & Groothoff, J. W. (2009). Behavioral Determinants as Predictors of Return to Work After Long-Term Sickness Absence: An Application of the Theory of Planned Behavior. *Journal of Occupational Rehabilitation, 19*(2), 166-174. Retrieve from https://doi.org/10.1007/s10926-009-9172-5

Chen, T. B., & Chai, L. T. (2010). Attitude towards the environment and green products Consumers' perspective. *Management Science and Engineering, 4*(2), 27-39.

Claiborne, C., & Sirgy, M. (1990). Self-Image Congruence as a Model of Consumer Attitude Formation and Behavior: A Conceptual Review and Guide for Future Research. *Proceedings of the 1990 Academy of Marketing Science (AMS) Annual Conference*, 1-7. Retrieve from https://doi.org/10.1007/978-3-319-13254-9_1

Cooper, D. R., & Schindler, P. (2014). *Business research methods*. McGraw-Hill.

Dash, A. (2021). Determinants of EVs adoption: a study on green behavior of consumers. *Smart and Sustainable Built Environment, 10*(1), 125-137. Retrieve from https://doi.org/10.1108/sasbe-02-2019-0015

Dodds, P. S., Harris, K. D., Kloumann, I. M., Bliss, C. A., & Danforth, C. M. (2011). Temporal patterns of happiness and information in a global social network: Hedonometrics and Twitter. *PloS one*, *6*(12), e26752. Retrieve from https://doi.org/10.1371/journal.pone.0026752

Ducoffe, R. H. (1996). Advertising value and advertising on the web. *Journal of advertising research*, *36*(5), 21-21.

Dunlap, R. E., & Jones, R. E. (2002). Environmental concern: conceptual and measurement issues. *Handbook of Environmental Sociology, 3*(1), 482-524.

Eagly, A. H., & Chaiken, S. (2020). The advantages of an inclusive definition of attitude. *Social Cognition, 25*(1), 582-602.

Egbue, O., & Long, S. (2012). Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. *Energy Policy, 48,* 717-729. Retrieve from https://doi.org/10.1016/j.enpol.2012.06.009

Engel, J. F., Blackwell, R. D., & Miniard, P. W. (1995). *Consumer Behavior* (8th ed.). The Dryden Press.

Farah, H. (2014). *Developing Scientific Research Methodology* [Paper Presentation]. 1st International Conference on Development of Research in Higher Education.

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research.* Addison-Wesley.

Fiske, S. T., Xu, J., Cuddy, A. C., & Glick, P. (1999). (Dis)respecting versus (Dis)liking: Status and Interdependence Predict Ambivalent Stereotypes of Competence and Warmth. *Journal of Social Issues, 55*(3), 473-489. Retrieve from https://doi.org/10.1111/0022-4537.00128

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research, 18*(1), 39-50. Retrieve from https://doi.org/10.1177/002224378101800104

Francis, J., Eccles, M. P., Johnston, M., Walker, A., Grimshaw, J. M., Foy, R., & Bonetti, D. (2004). *Constructing questionnaires based on the theory of planned behavior: A manual for health services researchers.* Centre for Health Services Research, University of Newcastle upon Tyne.

Franssonn, N., & Garling, T. (1999). Environmental concern: conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology, 19,* 369-382.

Graham-Rowe, E., Gardner, B., Abraham, C., Skippon, S., Dittmar, H., Hutchins, R., & Stannard, J. (2012). Mainstream consumers driving plug-in battery-electric and plug-in hybrid electric cars: A qualitative analysis of responses and evaluations. *Transportation Research Part A: Policy and Practice, 46*(1), 140-153. Retrieve from https://doi.org/10.1016/j.tra.2011.09.008

Greenspoon, P. J., & Saklofske, D. H. (1998). Confirmatory factor analysis of the multidimensional Students' Life Satisfaction Scale. *Personality and Individual Differences, 25*(5), 965–971. Retrieve from https://doi.org/10.1016/S0191-8869(98)00115-9.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*(1), 4-27. Retrieve from https://doi.org/10.1037//0033295x.102.1.4

Guojian, X., & Meihua, Z. (2020). Analysis of electric vehicle purchase behavior based on FPGA system and neural network. *Microprocessors and Microsystems, 74*(1), 103-361.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th ed.). NJ: Pearson Education.

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), *Sage Publications, 3*(1), 109-131.

Hawkes, C., Demaio, A. R., & Branca, F. (2017). Double-duty actions for ending malnutrition within a decade. *The Lancet Global Health, 5*(8), 745-746. Retrieve from https://doi.org/10.1016/s2214-109x(17)30204-8

Jaiswal, D., Kant, R., Singh, P. K., & Yadav, R. (2022). Investigating the role of electric vehicle knowledge in consumer adoption: evidence from an emerging market. *Benchmarking: An International Journal*, *29*(3), 1027-1045. Retrieve from https://doi.org/10.1108/bij-11-2020-0579

Kim, Y., & Choi, S. M. (2005). Antecedents of green purchase behavior: an examination of collectivism, environmental concern, and PCE. *Transport and Environment*, *36*, 96-106.

Lippmann, W. (1922). The world outside and the pictures in our heads. *Public opinion*, 3-32. Retrieve from https://doi.org/10.1037/14847-001

Liu, H., Sato, H., & Morikawa, T. (2015). Influences of environmental consciousness and attitudes to transportation on electric vehicle purchase intentions. *Asian Transport Studies, 3*(4), 430-446.

McCright, A. M., Xiao, C., & Dunlap, R. E. (2014). Political polarization on support for government spending on environmental protection in the USA, 1974-2012. *Social Science Research, 48*, 251-260. Retrieve from https://doi.org/10.1016/j.ssresearch.2014.06.008

Mishra, S., & Malhotra, G. (2019). Is India ready for e-mobility? An exploratory study to understand e-vehicles purchase intention. *Theoretical Economics Letters*, *9*(2), 218-376. https://doi.org/10.4236/tel.2019.92027

Nelson, M. R. (2002). Recall of Brand Placements in Computer/Video Games. *Journal of Advertising Research, 42*(2), 80-92. Retrieve from https://doi.org/10.2501/jar-42-2 8092

Patterson, L. (1991). *Chaucer and the Subject of History* (1st ed.). Univ of Wisconsin Press.

Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services, 29*, 123-134. Retrieve from https://doi.org/10.1016/j.jretconser.2015.11.006

Pedroso, R., Zanetello, L., Guimarães, L., Pettenon, M., Gonçalves, V., Scherer, J., Kessler, F., & Pechansky, F. (2016). Confirmatory factor analysis (CFA) of the Crack Use Relapse Scale (CURS). *Archives of Clinical Psychiatry (São Paulo), 43*(3), 37-40. Retrieve from https://doi.org/10.1590/0101-60830000000081

Rogers, E. (2003). *Diffusion of innovations*, (5th ed.). New York: Free Press.

Shalender, K., & Sharma, N. (2021). Using extended theory of planned behavior (TPB) to predict adoption intention of electric vehicles in India. Environment, *Environment, Development and Sustainability, 23*(1), 665-681. Retrieve from https://doi.org/10.1007/s10668-020-00602-7

Sharma, G. P., Verma, R. C., & Pathare, P. (2005). Mathematical modeling of infrared radiation thin layer drying of onion slices. *Journal of Food Engineering, 71*(3), 282–286. Retrieve from https://doi.org/10.1016/j.jfoodeng.2005.02.010

Sica, C., & Ghisi, M. (2007). The Italian versions of the Beck Anxiety Inventory and the Beck Depression Inventory-II: Psychometric properties and discriminant power. In M. A. Lange (Ed.), *Leading-edge psychological tests and testing research* (pp. 27–50). Nova Science Publishers.

Sirgy, M., Johar, J., Samli, A., & Claiborne, C. (1991). Self-congruity versus functional congruity: predictors of human behavior. *Journal of the Academy of Marketing Science, 19*(1), 363-375.

Suki, N. (2016). Green product purchase intention: impact of green brands, attitude, and knowledge. *British Food Journal, 118*(1), 2893-2910.

Topolšek, D., Babić, D., Babić, D., & Cvahte Ojsteršek, T. (2020). Factors influencing the purchase intention of autonomous cars. *Sustainability*, *12*(24), 108-303. https://doi.org/10.3390/su122410303

Wang, X., Pacho, F., Liu, J., & Kajungiro, R. (2019). Factors influencing organic food purchase intention in developing countries and the moderating role of knowledge. *Sustainability*, *11*(1), 209. Retrieve from https://doi.org/10.3390/su11010209

Warshaw, P. R. (1980). A new model for predicting behavioral intentions: An alternative to Fishbein. *Journal of marketing research*, *17*(2), 153-172. Retrieve from https://doi.org/10.1177/002224378001700201

Wu, J.-H., & Wang, Y.-M. (2006). Measuring KMS success: A respecification of the DeLone and McLean's model. *Information & Management, 43*(6), 728-739. Retrieve from https://doi.org/10.1016/j.im.2006.05.002

Wu, W., Hsiao, H., Wu, P., Lin, C., & Huang, S. (2011). Investigating the learning-theory foundations of game-based learning: a meta-analysis. *Journal of Computer Assisted Learning, 28*(3), 265-279. Retrieve from https://doi.org/10.1111/j.1365-2729.2011.00437.x

Yang, Y., Asoud, Y., & Dwivedi, Y. (2017). Examining the impact of gamification on intention of engagement and Brand attitude in the marketing context. *Computers in Human Behavior, 73,* 459-469. Retrieve from https://doi.org/10.1016/j.chb.2017.03.066