

The impact of new energy vehicle sharing value, emotional advertising appeal, emotional discourse, and self-determination on consumer loyalty

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Abstract: Purpose—In 2023, new energy vehicles became a trend in mainland China. In this study, we mainly investigated the views and feelings of mainland Chinese consumers on new energy vehicle advertising. This study aims to analyze how consumers recognize brand loyalty when purchasing new energy vehicles in mainland China (Zhejiang Province).

Design/methodology/approach—In our questionnaire, consumers N=315, we explored four hypotheses: shared value is positively correlated with self-determination, emotional advertising appeal is positively correlated with self-determination, emotional discourse is positively correlated with self-determination, and self-determination is positively correlated with consumer loyalty.

Findings – Moreover, our innovative findings address that (1) emotional advertising for new energy vehicles can increase consumer loyalty and (2) the power of shared value in the community can increase consumer loyalty.

Research limitations/implications—Our research's motivation is to understand new energy vehicle consumers who can identify with certain brands and further enhance their brand loyalty. Because the research is limited by workforce and material resources, we suggest that future researchers be more thoughtful in their design.

Originality/value—Our research is valuable because it investigates the ultimate brand loyalty of new energy vehicle consumers.

Keywords: shared value, emotional advertising, emotional discourse, self-determination, consumer loyalty

1. Introduction

New energy vehicles, or alternative fuel vehicles, refer to using unconventional (non-fossil fuel) energy as a power source, integrated vehicle power control and drive advanced technology, and the formation of advanced technical principles with new vehicle technology and structure. New energy vehicles have been launched continuously in mainland China, including BYD, Tesla, BMW, TOYOTA, and many other auto manufacturers have begun to provide market consumers with new energy vehicles. These vehicles aim to protect the earth's environment and reduce CO2 emissions. Understanding the concept of new energy vehicles, from gas-electric hybrid vehicles a few years ago to all battery vehicles in the past two years, can help shed light on reducing environmental pollution. The global climate in 2023 is considered the Year of the Holy Child because it resulted in a global extreme climate, including heavy rains and flooding in some places in mainland China, while heat and drought in others. To achieve the 2050 global net zero carbon reduction plan, new energy vehicles have been promoted as a new trend policy in mainland China.

Porter and Kramer (2011) define competitiveness as firms sharing and creating shared value. Thake and Zadek (1997) suggest that firms' shared value comes from the stakeholder's view of sharing, and Snell (2001) refers to the idea of firms and consumers working together to co-create a product's value and knowledge. On the other hand, Kramer (2011) shows how firms share product usage knowledge with consumers.

Chowdhury et al. (2008) mentioned that pictures in advertisements evoke consumers' memories. Further, Hartmann et al. (2013) noted that consumers' emotional responses to advertisements affect subsequent purchase attitudes and brand perceptions. Homer (2006) emphasized that consumers emotionally connect to advertisements when seeing pictures or videos. However, Homer and Yoon (1992) found that some consumers who see an emotional advertisement will still prioritize the product's price.

Edell and Burke (1987) mentioned that emotional discourse determines consumer behavior (e.g., positive and negative). Clore and Storbeck (2006) explored how emotional discourse attracts attention and persuades consumers. Meanwhile, Muehling and McCann (1993) mentioned that emotional discourse encourages consumers to participate. Therefore, the emotional discourse extended by emotional advertisements is an essential concept for consumers.

Livet (2016) mentioned that a consumer's cognitive-emotional behavior will affect the consumer's subsequent decision-making. Trope and Liberman (2010) stated that consumers make decisions based on their psychological factors and thoughts. Schacter and Addis (2007) noted that an individual's cognition and memories affect their subsequent decision-making. Merck et al. (2016) also emphasized that an individual's and a group's thoughts impact consumers' purchase decisions.

Schacter and Addis (2007) mentioned that cognition is influenced by the context and the memory of an individual's perceptions. On the other hand, Manier and Hirst (2008) noted that cognition is influenced by an individual's autonomous conscious viewpoints, while Shteynberg et al. (2020) posited that other groups' thoughts influence an individual's perceptions. Wertsch et al. (2021) mentioned that an individual's consciousness and thoughts affect other people's thoughts. Therefore, an individual's perception affects other people's perception, mainly from the individual and other people's communication.

Martin et al. (2014) mentioned that external stimuli sometimes influence an individual's perception. However, Bandura (1989) pointed out that perception comes from self-perceived reflections and thoughts. Flower (1994) also stated that human values, cognition, emotions, and attitudes influence each other. Therefore, the theory of perception extends from an individual's point of view to the communication and interaction between people. Such a series of perceptual processes will affect the behavior of other people.

Furthermore, Kaya et al. (2019) mentioned that a consumer's continued purchase is representative of consumer loyalty behavior. Schmidt and Eisend (2015) mentioned that consumer habits and attitudes affect the subsequent state of consumer loyalty. Keiningham et al. (2009) pointed out that consumer loyalty comes from brand recognition. Therefore, we hypothesize that consumers in the Chinese market pay attention to the advertising and product content of new energy vehicles. Moreover, understanding how consumers can retain their loyalty to the product is an exciting topic worth studying.

Table 1.1 shows that consumer loyalty is linked to consumers' perceptions and influences their judgment and purchase decisions.

Table 1.1 Illustrative research summarizing the antecedents to consumer loyalty in new energy vehicles

Illustrative research	Context	Theoretical basis	Antecedents to purchase intention in social commerce	Key findings or propositions
Jane Abigail et al. (2024)	Between online sellers and buyers	Seminal theory	Affect, Cognition	The findings suggest that affect and cognition influence product quality and online shopping experience.

Teng Guo et al. (2023)	Between sellers and buyers	Psychological theory	Affect, Cognition	The findings suggest that Price promotion considering the reference price effect and consumer loyalty.
Prasadja Ricardianto et al. (2024)	Between online sellers and buyers	Psychological theory	Service Perceived Perceived risk, policy, quality,	The findings suggest that what makes consumers attitudinal loyalty to ride-hailing services? An investigation of Indonesian consumers' perceived safety.
Mark Anthony Camilleri and Raffaele Filieri (2023).	Between online sellers and buyers	Theory of consumption values	Emotional Value	The results show that customer satisfaction and loyalty with online consumer reviews.
Bing Zheng et al. (2022)	Between online sellers and buyers	Theory of consumption values	Emotional Value	The results show that logistics service quality and energy service in business-to-consumer (B2C) online retailing impact customer loyalty in a circular economy.
Jeandri Robertson et al. (2022)	Between online sellers and buyers	Online community experience theory, Commitment theory	Community experience, attitude Brand	The findings suggest that brand love is an often ignored yet important dimension in consumer-brand relationships.
Lars Meyer-Waarden et al. (2023)	Between sellers and buyers	Commitment theory	Perceived value	Perceived value is positively related to building customer relationships with customer loyalty as one of their primary goals.
Chinnasamy et al. (2022)	Between online sellers and buyers	Social Response Theory	Perceived Usefulness, Perceived Enjoyment	The results demonstrated that by modeling the significance of social media marketing activities, brand equity Moreover, loyalty to predict consumers' willingness to pay premium prices for portable tech gadgets.
Anurag Dugar and Pankaj Chamola	Between sellers and buyers	Commitment theory	Motivation, Interactivity, Informativeness, and Perceived Relevance	The key results indicate the significant impact of exploring the existence and antecedents of brand loyalty in small,

(2021).					unorganized retailers.
Cheng and Lin (2022)	Between online sellers and buyers	Social Theory	Response	Self-presentation gratification, Customer resonance	The results show the role of senses on purchase intention in social commerce.
Harsandaldep Kaur et al. (2020)	Between online sellers and buyers	Social Theory	Learning	Cognitive Appraisals, Affective Appraisals	The results suggest that identification and reward on Consumer Brand Engagement and brand loyalty in virtual brand communities.
Md Rokonuzzaman et al. (2020)	Between online sellers and buyers	Attraction Theory		Flow Experience	The results indicate that An investigation into the link between consumer product involvement and store loyalty.
Malin Sundström et al. (2020)	Between online sellers and buyers	Attraction Theory		Perceived utilitarian value, Perceived social value	The results suggest re-positioning customer loyalty in a fast-moving consumer goods market.

2. Literature review

2.1 Shared Value

The concept of shared value, proposed by Michael E. Porter, a famous American economist, refers to enterprises' creation of economic and social values through addressing social issues. Sisodia (2009) pointed out shared value and value creation concepts. Porter and Kramer (2011) pointed out that shared value comes from rethinking the positioning and value of products. While Oxfam (2018) found that Asian enterprises like to share value in the supply chain, Moon et al. (2011) emphasized that value sharing is a concept of business value with economic benefits. Bhamra and Lofthouse (2007) mentioned that environmental and social ideas can be considered together in product design. Vicki Blakney Eveland et al. (2024) refer to when shared values match concepts. Chao Tian et al. (2024) refer to value cocreation in shared mobility in China. Our research shows that the value of new energy vehicles can be further shared with the community and other consumers.

2.2 Emotional Advertising Attraction

Emotional advertisement copywriting is a form of emotional appeal. Through emotional provocation or rendering of feelings, consumers can have an emotional response or mental shock, resonate strongly, and stimulate their desire to buy and act.

Kotler and Armstrong (2009) have shown how sellers can create sustainable purchases through emotional advertising. Aaker and Norris (1982) proposed the concept of the seller's emotional appeal to the buyer. Holbrook and O'Shaughnessy (1984) mentioned that emotional advertising depends on the product type. Further, Armstrong (2007) posited that effective advertising is more important than rational advertising. However, Goldberg and Gorn (1987) argued that emotional advertising is more effective for consumers than rational advertising. Panda et al. (2013) pointed out that emotional advertising is helpful for further connecting with consumers' emotions and using products to make connections. Notably, Gopinath et al. (2014) mentioned that the emotional advertising ratio impacts sales. Lwin et al. (2014) emphasize that emotional advertising has the best chance of developing potential consumers and building relationships with them.

2.3 Emotional discourse

Emotional words are primarily related to the consumer's identity watching the advertisement. However, emotional discourse is related to psychology and depends on whether the consumer trusts the relationship or identifies with the advertisement. Emotional advertising mainly understands whether consumers can rationally buy new energy automobile products in response to the advertisement, including understanding consumers' attitudes and perceptions towards the content of the advertisements. Ravid and Tolchinsky (2002) mentioned that emotional words can come from various environments and simulated states. In addition, Stanton et al. (2019) posited that a person's emotional words come from the interpersonal relationship with the person. Felix Septianto (2021) refers to advertising images to promote experiential offerings. Alfred Suc et al. (2023) refer to the role of autonomous sensory meridian response (ASMR) in green advertising. Consumers have an essential concept of emotional speech advertisements, the authenticity of which is verified in the later part of this paper.

2.4 Self-determination

Self-determination asserts that people develop their attitudes by observing their behavior and concluding what attitudes lead to that behavior (emotional responses are ambiguous when there are no previous attitudes due to lack of experience, etc.). Self-determination mainly refers to the degree to which an individual can be accepted, understood, and cared for by the social group. The theory is inherently counter-intuitive because the traditional view is that attitudes determine behavior. Moreover, the theory suggests that people show attitudes without access to internal cognitive and emotional states. The person would rationally explain their overt behavior as they try to explain those of others. La Guardia et al. (2000) referred to the concept of self-determination coming from one's autonomy and ability to relate. In addition, Eden and Aviram (1993) stated that people with high self-efficacy feel more extraordinary accomplishment after deciding on things. Deci and Ryan (2000) also noted that self-determination comes from the relationship between the buyer and the seller. Deci and Ryan (1985) stated that self-determination comes from participating in various activities. Ryan et al. (2008) described how an individual participating in any activity ends up in a social environment. Graduate Yumei Lei (2024) refers to exploring the interplay of motivation to learn science, self-regulation, and emotional intelligence from the perspective of self-determination theory. Self-determination refers to consumers deciding upon their thoughts; their attitudes determine subsequent perceptions of consumer loyalty. These motivational factors mainly come from specific internal or external factors. Seyyed Babak Alavi (2024) refers to exploring consumers' ultimate happiness through self-determination.

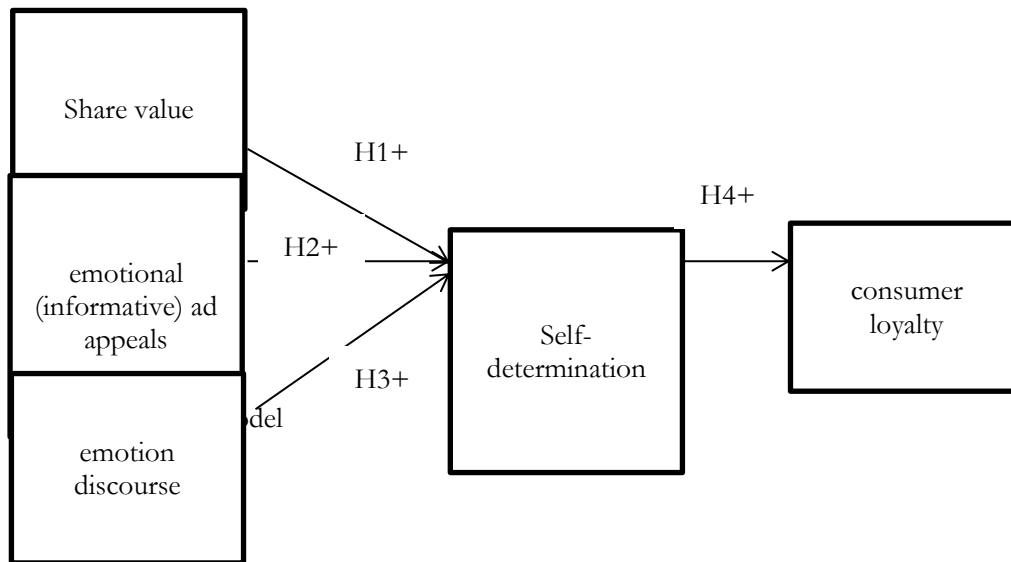
2.5 Consumer Loyalty

Consumer loyalty refers to the degree to which a consumer identifies with a product. In particular, it refers to the degree to which a consumer develops an attachment to, forms a preference for, and repeatedly purchases the products or services of a particular firm over time due to a variety of factors such as quality, price, and service. Grewal et al. (2016) showed that consumers develop attachment and loyalty to the brand of a product. Chen et al. (2016) found that mobile advertising is a form of advertising that affects consumer perceptions and loyalty. With the significance of brand loyalty to sellers, the question now lies in maintaining the loyalty of the original consumers to build up buyer relationships and maintain long-term partnerships. Researchers have pointed out some factors: Howat and Assaker (2013) mentioned that good service could increase consumer loyalty; Yoshida (2017) emphasized that consumer social network experience and service can further achieve consumer loyalty. In addition, Zhao et al. (2014) mentioned that there are two crucial factors of consumer loyalty: (1) consumers continued use of the product and service and (2) consumers' emotional connectedness to the product. Further, Olsen (2007) pointed out that consumer satisfaction mainly comes from loyalty and behavioral relationships.

2.6 Cognitive Theory

We often evaluate or have an attitude towards a thing or an object, after which we behave according to that attitude. However, sometimes, we need clarification about our internal attitude and rely on observing our behavior. John Sweller (2024) pointed out that cognition can increase memory and cognition through learning. Ying Wang et al. (2024) refer to exploring the effects of social- and personal-based comparisons from cognitive emotion theory. Kalyuga and Singh (2016) mentioned that the theory of cognition comes from a combination of

concepts related to affective neuroscience, cognitive psychology, and psychology. Tang et al. (2019) stated that self-cognition comes from perceptions and thoughts. Meanwhile, Kalyuga (2007) mentioned that learned perceptions influence self-cognition. Flower and Hayes (1981) have shown that cognitive emotions come from the influence of family or friends. A. Wibowo (2006) mentioned the concept of knowledge sharing of products to other people. With all premises considered, consumers' perception of the products in the new energy vehicle advertisement will be further generated from the consumer's perception and sharing of information, creating a cognitive view.



3. Research hypothesis architecture and development

3.1 Research design

Our study focuses on the loyalty of consumers to new energy vehicles and creates four research hypotheses. In particular, we explored the variables of shared value, emotional advertising appeal, emotional discourse, self-determination, and consumer loyalty to design the research framework. Our sample survey mainly used on-site new energy vehicle stores to survey and fill in questionnaires for consumers who came to see the cars. We mainly asked people from Tesla, Xpeng, Weilai, and BMW to see the cars on-site. Consumers are the main targets of the investigation. We mainly investigated the new energy vehicle market in Zhejiang Province in mainland China.

3.2 Share Value

Chatain (2011) pointed out that value creation can create competitiveness for firms. Gürel and Tat (2017) mentioned that the cocreation of value between consumers and firms can bring influence to firms. However, Porter and Kramer (2011) pointed out that a firm's business strategy should be first positioned before value can be co-created. Maon et al. (2009) emphasized the importance of shared value in business. Perren and Kozinets (2018) mentioned that shared value comes from exchanging experiences. Lutz et al. (2018) pointed out that consumers are willing to share their perceptions. Martinez-Cañas et al. (2016) mentioned that consumers' perceptions create value together with firms. Therefore, we hypothesize as follows:

H1: Shared value is positively related to self-determination.

3.3 Emotional Advertising Attraction

Janiszewski (1993) mentioned that emotional advertisements appeal to consumers. Lerner and Keltner (2001) mentioned that emotional advertisements have psycho-emotional factors that consumers see as liking or fearing. Rudd et al. (2012) mentioned that emotional advertisements have factors that are important for consumer persuasiveness. Therefore, we hypothesize as follows:

H2: Emotional advertisement appeal is positively related to self-determination.

2.4 Emotional discourse

Achar et al. (2016) mentioned that emotional discourse comes from different stages and is perceived differently by consumers. Choi et al. (2019) mentioned the persuasive view of emotional advertisements on consumers. Han et al. (2007) mentioned the emotional view on the subsequent relationship maintenance of the consumers. Therefore, we hypothesize as follows:

H3: Emotional discourse is positively related to self-determination.

3.5 Self-determination

Self-determination is a kind of human motivation. Lerner and Keltner (2001) mentioned the importance of consumer decisions. Allen (2018) proposed that consumer judgment and decision-making influences are essential for the market. Shiota et al. (2007) mentioned that consumers are stimulated to self-determine. Therefore, we hypothesize as follows:

H4: Self-determination is positively related to consumer loyalty.

4. Research method

Our study developed a new model framework for creating new energy vehicles. We formulated stable and reliable questionnaire items to measure the variables in designing the questionnaire. We designed the questionnaire design items for continuity, reliability, and consistency. Then, we measured and evaluated the reliability and consistency of the SEM tool through the questionnaire after the administration and tested the correlation analysis between the models in the model of the research tool.

4.1 Content validity

We designed and developed a set of reliable questionnaire items and content to measure its variables in the context of appropriate research framework design and environment under the new energy vehicle questionnaire design. We designed the SEM instrument's reliability and consistency, including shared value, emotional advertising appeal, emotional discourse, self-determination, and consumer loyalty, to observe the relationship between its overall reliability and validity. We used Rackow et al.'s (2013) seven-point Likert scale to verify the overall reliability and validity of the questionnaire. The measurements ranged from strongly disagree (1) to strongly agree (7). Subsequently, we applied SEM to measure the relationship among the variables.

4.2 Pre-text and pilot-test

To improve the question content and overall design of the 39-item questionnaire on new energy vehicles, we conducted a pre-test on a sample of fifteen academic experts and fifteen Master's and PhD students, as mentioned by Pasquali (1999), to minimize the sample size and investigate and validate the questionnaire's questions.

All respondents were asked to complete the questionnaire and provide comments on the presentation, comprehensibility, and clarity of the items, as well as the overall appearance and content of the questionnaire. Finally, the content of the questions was modified to fit the difficult questions, and the questionnaire was obtained to test our research model. Table 1 lists the 39 items, the corresponding constructs of the measured variables, and the reference sources. In order to make the overall questionnaire understandable and answerable by the respondents, we simulated, observed, and analyzed the variables during the testing process. We conducted a questionnaire survey based on consumers who came to see the cars at the on-site new energy vehicle dealer. It is designed for consistency and extensibility, with scientific rigor in the questionnaire design process. The design of the questionnaire is tailored to its content so that the respondent can answer the questions accurately.

4.3 Data collection

In Table 1, we designed our questionnaire to address the variables of the questionnaire. Variables include (1) Shared value, (2) Emotional ad appeals, (3) Emotional discourse, (4) Self-determination, and (5) Consumer loyalty. Our questionnaire is designed to extend to relevant scholars. Table 1.2 shows that the design of the questionnaire is rigorous and thorough, which is in line with the design and concept of the questionnaire survey.

Table 1.2 Constructs and measures of the research items

Construct		Source
Shared value		
SV1	I want to know whether new energy vehicles meet the requirements of green product information and business.	Oxfam (2018)
SV 2	New energy vehicle products can provide consumers with green environmental protection.	
SV 3	I am willing to share content on new energy vehicle products.	
SV 4	I agree that new energy vehicle products can solve environmental protection.	
SV 5	I agree that new energy vehicles can improve air pollution.	
SV 6	I agree that new energy vehicle products will improve CO2 emissions in the future.	
SV 7	New energy vehicle products can satisfy me.	
SV 8	New energy vehicle products have enabled consumers to accept and share information.	
SV 9	I am willing to share content on new energy vehicle products with others.	
SV 10	New energy vehicle products can share content in the community.	
SV 11	New energy vehicle products allow consumers to be attracted and discussed.	
SV 12	New energy vehicle products can share content with other friends.	
SV 13	New energy vehicle products allow consumers to share product value.	
Emotional ad appeals		
EM 1	New energy vehicle products will meet consumer purchase needs.	Rudd et al. (2012)
EM 2	New energy vehicle products will make consumers agree with the product's image.	
EM 3	New energy vehicle advertising products will make consumers agree with the concept.	
EM 4	Emotional text in new energy vehicle advertisements can be recognized by consumers.	
EM 5	Advertisements for new energy vehicles attract consumers to care for the earth's environment.	
EM 6	New energy vehicle advertisements will convince consumers that they are not producing CO2.	
EM 7	New energy vehicle advertising will contact consumer relations.	
EM 8	Emotional advertisements for new energy vehicles will be attractive to consumers.	
EM 9	New energy vehicle product advertisements will be of great help to consumers.	
EM 10	New energy vehicle product advertisements will be attractive to consumers.	
EM 11	New energy vehicle product advertisements have a sense of identity with consumers.	
EM 12	Energy saving and carbon reduction requirements are attractive to future consumers.	
EM 13	Fuel-efficient cars can help consumers get involved.	
Emotion discourse		
ED1	Consumers comment on the advantages of products on the new energy product platform.	Choi et al. (2019)

Construct	Source
ED2	Consumers explain on the new energy product platform that the product will be satisfied.
ED3	Consumers are willing to buy new energy vehicle products.
ED4	You and your consumers will be willing to share the earth-loving new energy vehicle products.
ED5	Consumers will buy new energy vehicles in response to price increases.
ED6	You and consumers will discuss new energy products to share content.
ED7	Consumers will share the advantages of products on the platform.
ED8	Consumers are willing to buy new energy products related to the earth's environment.
ED9	Consumers will share new energy product content through emotional discourse.
ED10	You and your consumers will discuss the environmental protection of new energy products.
ED11	You and your consumers will discuss new energy vehicle products and share experiences.
ED12	You and your consumers will like live streaming to interact and share new energy vehicle products.
ED13	You and your consumers like to explain new energy products through social platforms.
Self-determination	
SD1	When buying new energy vehicle products, consumers can make their own decisions.
SD2	Consumers already have self-motivation in the process of new energy vehicle products.
SD3	New energy vehicle products make consumers happy to buy.
SD4	New energy vehicle products will allow consumers to make impulse purchases.
SD5	New energy vehicle products allow consumers to generate motivation to purchase and use.
SD6	New energy vehicle products provide consumers with new purchasing methods.
SD7	New energy vehicle multi-style products for consumers to choose to buy.
SD8	The after-sales service of new energy vehicle products is still up to consumers to decide.
SD9	You and your consumers will pass on ideas and decide to buy new energy vehicle products.
SD10	You and your consumers communicate on new energy vehicle products and provide a series of services.
SD11	You and your consumer partners will pass on new energy vehicle product innovation service information.
SD12	You and your consumer partners will pass on the quality of new energy vehicle products to make me decide to buy.
SD13	You and your consumer partners will share the innovative points of new energy vehicle products and let me buy them.
Consumer loyalty	
CL1	New energy vehicle products have an impact on consumer loyalty.
CL2	New energy vehicle products and services have an impact on consumer loyalty.
CL3	I have become loyal after using new energy vehicle products.
CL4	New energy vehicle product design makes consumers satisfied and loyal.
CL5	Consumers share their feelings about buying new energy products.

Shiota et al. (2007)

Chen et al. (2016)

Construct	Source
CL6	You and your consumers will love to share the value of new energy products.
CL7	You and your consumers will use the social platform to recommend new energy vehicle products.
CL8	Consumers will recommend and share opinions on new energy vehicle products on the platform.
CL9	Consumers use other forums to discuss products on new energy vehicle products.
CL10	Consumers will consider purchasing new energy vehicle products in response to the information delivered by email.
CL11	Consumers will develop loyalty to new energy vehicle products.
CL12	Consumers choose trusted platforms to purchase new energy vehicle products.
CL13	Consumers agree with word-of-mouth communication content of new energy vehicle products.

4.4 Data collection and respondents' profiles

We distribute the questionnaire to the respondents at the new energy vehicle store. We distributed 385 questionnaires, and 315 responded, with a response rate of 82%. Our collection period is three months and will be distributed from July to October 2023 Zhejiang Province. Then, we took the questionnaire to new energy vehicle stores on-site. Our study was designed with five variables, for which structural equation modeling (SEM) was conducted. Our questionnaire is designed to collect the samples. The overall demographic data analysis can be seen in Table 2, which shows the primary correlation analysis and proportionality relationship.

Table 2 The demographic and characteristic profiles

Demographic profile	Number of firms	Percentage
Gender	N=315	
male	38	38
female	62	62
Age	N=315	
below19	19	19
20-24	59	59
25-29	6	6
30-34	3	3
35-39	3	3
40-44	4	4
45-49	2	2
above50	4	4
occupation	N=315	
student	76	76
Serving officers	19	19
retired people	1	1
Unemployed	1	1
housekeeper	1	1

other	3	3
income	N=315	
below 4000	72	72
4001-7000	9	9
7001-10000	7	7
10000-12000	3	3
above13000	9	9
Frequency of playing game platforms	N=315	
below 5	86	86
6-9	8	8
10-15	3	3
16-19	2	2
20-25	0	0
26-29	1	1
above30	1	1
How many years of experience have you used a gaming platform?	N=315	
below six months	73	73
6 month-1 year	8	8
1 year-3 year	12	12
3 year-6 year	4	4
above6 year	3	3

4.5 Common method bias

Co-methodological bias refers to the artificial co-variation between the predicted and the validity variables due to the same data sources or raters, measurement environment, the project context, and the project characteristics. This type of human co-variation is a form of systematic error that can seriously confound the results of a study and potentially mislead the conclusions. Co-methodological bias is widespread in psychological and behavioral science research, especially in studies employing questionnaires.

Two random variables may or may not be independent. Independence is random independence, where the value of one does not affect the value of the other. If the two random variables are not independent, there is a relationship between them. This relationship may be strong or weak; thus, we need to explore the strength of the relationship between the dependent variable and the effect variable.

5. Data analysis and findings

We developed a new Structural Equation Modelling (SEM) model by applying Amos 24.0 and analyzed the whole data structure and significance relationships. SEM is mainly concerned with observing the correlation between variables and potential variables and constructing one or more factors to be analyzed. SEM is classified into measurement and modeling, mainly analyzed by measurements and models (Anderson & Gerbing, 1988). Structural analysis examines causal relationships, which can be seen through the data analysis. In particular, structural equation modeling (SEM) is a statistical method used to analyze patterns of causal relationships, which can also be used for path analysis (PA), factor analysis, regression analysis, and variability analysis.

5.1 Assessment of the measurement model

Our main study applies the structural equation model to the design and further estimates the overall relationship between structure and measurement. First, we analyzed 65 items to assess whether the structure and measurement could be combined appropriately. Throughout the study, we examined the overall fitness profile, structure, and measure to see the fitness profile. Our design conforms to the structural equation model to address the concept of SEM architecture.

5.2 Assessment of the structural model

We conclude that the overall fit of the structural model is acceptable, as all the fit metrics reached acceptable levels ($\chi^2 = 8719.491$, $df = 2011$, $\alpha = 0.001$; GFI = 0.492; AGFI = 0.458; CFI = 0.797; NFI = 0.752; RMSEA = 0.103). Our overall measure and structure conform to the fit's overall structural equation model.

Table 3 Scalar estimates of the structural model

				Standardized regression weights	Standard error	t-value	Variances	Squared multiple correlations
Measured Variable								
SV13	SV13	SV13	SV13	SV13	SV13	SV13	SV13	SV13
SV12	SV12	SV12	SV12	SV12	SV12	SV12	SV12	SV12
SV11	SV11	SV11	SV11	SV11	SV11	SV11	SV11	SV11
SV10	SV10	SV10	SV10	SV10	SV10	SV10	SV10	SV10
SV9	SV9	SV9	SV9	SV9	SV9	SV9	SV9	SV9
SV8	SV8	SV8	SV8	SV8	SV8	SV8	SV8	SV8
SV3	SV3	SV3	SV3	SV3	SV3	SV3	SV3	SV3
SV1	SV1	SV1	SV1	SV1	SV1	SV1	SV1	SV1
ED1	ED1	ED1	ED1	ED1	ED1	ED1	ED1	ED1
ED3	ED3	ED3	ED3	ED3	ED3	ED3	ED3	ED3
ED4	ED4	ED4	ED4	ED4	ED4	ED4	ED4	ED4
ED6	ED6	ED6	ED6	ED6	ED6	ED6	ED6	ED6
ED7	ED7	ED7	ED7	ED7	ED7	ED7	ED7	ED7
ED8	ED8	ED8	ED8	ED8	ED8	ED8	ED8	ED8
ED10	ED10	ED10	ED10	ED10	ED10	ED10	ED10	ED10
ED11	ED11	ED11	ED11	ED11	ED11	ED11	ED11	ED11
ED13	ED13	ED13	ED13	ED13	ED13	ED13	ED13	ED13
EI13	EI13	EI13	EI13	EI13	EI13	EI13	EI13	EI13
EI11	EI11	EI11	EI11	EI11	EI11	EI11	EI11	EI11
EI10	EI10	EI10	EI10	EI10	EI10	EI10	EI10	EI10
EI9	EI9	EI9	EI9	EI9	EI9	EI9	EI9	EI9
EI8	EI8	EI8	EI8	EI8	EI8	EI8	EI8	EI8
EI7	EI7	EI7	EI7	EI7	EI7	EI7	EI7	EI7
EI3	EI3	EI3	EI3	EI3	EI3	EI3	EI3	EI3
EI2	EI2	EI2	EI2	EI2	EI2	EI2	EI2	EI2

EI1	EI1	EI1	EI1	EI1	EI1	EI1	EI1
SD13	SD13	SD13	SD13	SD13	SD13	SD13	SD13
SD12	SD12	SD12	SD12	SD12	SD12	SD12	SD12
SD11	SD11	SD11	SD11	SD11	SD11	SD11	SD11
SD10	SD10	SD10	SD10	SD10	SD10	SD10	SD10
SD9	SD9	SD9	SD9	SD9	SD9	SD9	SD9
SD8	SD8	SD8	SD8	SD8	SD8	SD8	SD8
SD7	SD7	SD7	SD7	SD7	SD7	SD7	SD7
SD3	SD3	SD3	SD3	SD3	SD3	SD3	SD3
SD1	SD1	SD1	SD1	SD1	SD1	SD1	SD1
CL4	CL4	CL4	CL4	CL4	CL4	CL4	CL4
CL5	CL5	CL5	CL5	CL5	CL5	CL5	CL5
CL6	CL6	CL6	CL6	CL6	CL6	CL6	CL6
CL7	CL7	CL7	CL7	CL7	CL7	CL7	CL7
CL8	CL8	CL8	CL8	CL8	CL8	CL8	CL8
CL9	CL9	CL9	CL9	CL9	CL9	CL9	CL9
CL12	CL12	CL12	CL12	CL12	CL12	CL12	CL12
CL13	CL13	CL13	CL13	CL13	CL13	CL13	CL13
Latent Variable							
SD	SD	SD	SD	SD	SD	SD	SD
SD	SD	SD	SD	SD	SD	SD	SD
SD	SD	SD	SD	SD	SD	SD	SD
CL	CL	CL	CL	CL	CL	CL	CL

Table 4 Convergent validity and internal consistency reliability

Latent Variable	Composite reliability (CR)	Average variance extracted (AVE)	Cronbach's α
SV	0.966	0.782	0.966
EI	0.975	0.815	0.976
ED	0.305	0.786	0.97
SD	0.947	0.666	0.971
CL	0.275	0.743	0.975

5.3 Test of mediating effects

Tables 5 and 6 show the existence of mediating relationships between the mediating effects in its structural equation modeling, including the independent variable (Sharing Value, Emotional Ad Attraction, Emotional Discourse), mediating variable (Self-Determination), and dependent variable (Consumer Loyalty). As shown in Table 4, the coefficients of the overall discriminant validity are highly correlated with each other and have a specific validity relationship. Table 4 shows that the overall reliability of the structural equation is more significant

than 0.7, which is consistent with the whole SEM test.

5.4 Hypotheses' testing

Throughout the SEM data process, we parsed the deconstructed equation model for the relationship between the dependent and outcome variables. We applied the ML estimates to the predictions and analyses. We determined the overall path relationship (as shown in Figure 2), which shows that the four hypotheses' tests support the original hypothesis test and that the four hypotheses meet the positive correlation. Figure 2 further shows that the four hypotheses have a significant positive correlation.

Structural equation modeling (SEM) is a statistical method for analyzing the pattern of causal relationships. It can also be used for path analysis (PA), factor analysis, regression analysis, and analysis of variance.

The mean and significance relationships throughout the study can be seen in the factor analyses in Table IV. Table 4 shows that Cronbach's alpha value for each variable is more significant than 0.7, which is in line with the value of the validated analytical reliability of the structural equation model. Table IV also reveals the coefficient relationship for the whole matrix statement. In addition, the reliability and validity in Table IV and Table V are demonstrated, the relationship between their path analyses is presented in Table VI, and the direct and indirect relationships are shown in Table VII. Further, Table III proves that its reliability is by the relationship between the structural equations. Table IV shows the relationship between the coefficients of the district validity analyses. Table 5 shows the path analysis, and Table 6 shows the relationship between direct and indirect effects.

From Figure 2, we can see the significance of the four hypothesized relationships as positive relationships. This finding is consistent with the initial findings in Figure 1, showing the consistency of the four hypothesized relationships.

Table 5 Discriminant validity

Construct	CL	SD	EI	ED	SV
CL	0.862				
SD	0.951	0.817			
EI	0.935	0.94	0.903		
ED	0.953	0.969	0.968	0.887	
SV	0.891	0.913	0.939	0.925	0.885

Table 6 Result of path analysis

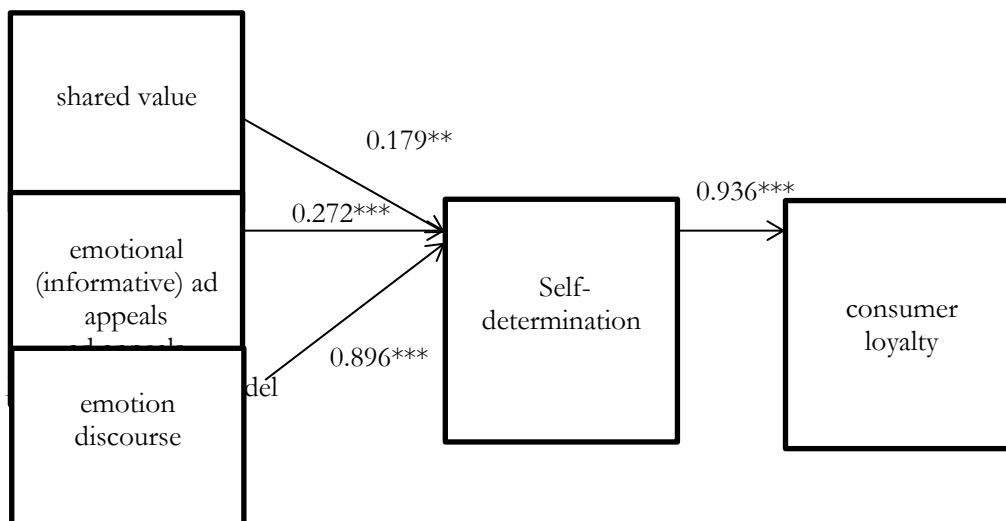
Assumption Path					Hypothetical relationship	Standardized weights /Significance	regression Hypothesis true or not (Y/N)
H1	SD	<---	SV	positive correlation	0.179**	Y	
H2	SD	<---	EI	positive correlation	0.272***	Y	
H3	SD	<---	ED	positive correlation	0.896***	Y	
H4	CL	<---	SD	positive correlation	0.936***	Y	

*, **, and *** denote significance at $\alpha = 0.05$, $\alpha = 0.01$, and $\alpha = 0.001$, respectively.

Latent variable	independent Latent variable	dependent	Direct Effects	Indirect Effects	Total Effects
EI	SD		0.272	—	0.272
ED	SD		0.896	—	0.896
SV	SD		0.179	—	0.179
EI	CL		—	0.255	0.255
ED	CL		—	0.839	0.839
SV	CL		—	0.167	0.167
SD	CL		0.936		0.936

*, **, and *** denote significance at $\alpha = 0.05$, $\alpha = 0.01$, and $\alpha = 0.001$, respectively.

“—”no effect, respectively.



5.5 Multi-group analysis

Tables 3-7 show that the new energy vehicle process in sharing value, emotional advertising appeal, emotional discourse, and self-determination of consumer loyalty has a significant relationship. In the whole framework, we can see from the research model in Fig. 2 that all hypotheses have a positive significance correlation.

We conducted a subgroup structure and a subgroup analysis of the gender of the subgroups. Significant differences exist in the relationship between these two clusters in the analysis process. Cluster analysis is a method of data streamlining in which samples are grouped to form clusters based on their common attributes. Usually, distance is used as the basis for classification; the closer the distance, the higher the degree of similarity. Classifying clusters can make the differences between the clusters small and between the clusters large.

6. Discussion

According to our assumptions, this paper designs five variables: generation of shared value, emotional advertising appeal, emotional discourse, and self-determination to consumer loyalty. Figure 2 shows that the four hypotheses have a significant positive correlation. Such a finding is consistent with previous related studies (Cohen & Prusak, 2001). In the research structure, shared value, attractiveness of emotional advertising, emotional discourse, and self-determination are positively related to consumer loyalty. We can observe the impact of the new energy vehicle process on consumer loyalty and answer whether it can be affected by the content factors of the entire new energy vehicle. Hence, it becomes the cognitive theory's effect in the service innovation process. Our finding shows that

cognitive theory is critical to establishing consumer loyalty. Our research has made significant contributions to China's new energy vehicles and helped the upgrading of new energy vehicles. Some academic shortcomings; few people are investigating consumer psychological factors in the field of new energy vehicles. We have combined concepts such as information management, psychology, and marketing to conduct a series of design and research. Table 7 and Table 8 show the gender grouping in this study, revealing significant differences.

Table 7 Significance of the measurement model based on gender clusters (male measurements)

	Path			Standardized loading	t	p
H1	SD	<---	SV	0.214	2.342	P=0.019**
H2	SD	<---	EI	-0.021	-0.217	P=0.828
H3	SD	<---	ED	0.961	3.302	P<0.001***
H4	CL	<---	SD	0.941	3.549	P<0.001***

Table 8 Significance of the measurement model based on gender clusters (female measurements)

	Path			Standardized loading	t	p
H1	SD	<---	SV	0.158	1.937	P=0.053*
H2	SD	<---	EI	0.446	3.975	P<0.001***
H3	SD	<---	ED	0.806	6.248	P<0.001***
H4	CL	<---	SD	0.931	9.273	P<0.001***

6.1 Theoretical implications

We are developing a new research model for new energy vehicles, and the ideas and concepts of the study are as follows. It is clear from our study that all four hypotheses are positively correlated. We also used cognitive theory to convey the development of psycho-emotional relationship factors between buyers and sellers. Finally, we found that the cognitive theory can influence consumers' perception of new energy vehicles. We note that the perception theory is an important concept, and consumer loyalty behavior towards new energy vehicles can be used to understand their perception of the products and services. These concepts help further understand the meaning behind the consumers' purchase of new energy vehicle products. Moreover, to comply with the global carbon reduction policy in mainland China, new energy vehicle products have become a new trend direction for the service and application of new energy vehicles in the future.

6.2 Managerial and practical implications

Our research focuses on the process service of consumer loyalty in new energy vehicles and how both parties convey the meaning of purchase behind the consumers through the perception theory. First, perception theory is an essential conceptual factor. In marketing, especially the new energy vehicle products on the market, consumers want to understand the brand and quality of the product, so the perception theory of transmission. Second, the appeal of emotional advertising can be seen in the speed of emotional connection and diffusion among consumers, who recommend or leave their opinions about new energy vehicle products in the community. Third, the shared value of the new energy vehicle product, the emotional appeal of the advertisement, the emotional topic, and the idea that the self-determination process ends in consumer loyalty.

In H1, we hypothesized that shared value is positively and significantly related to self-determination. Matos and Silvestre (2013) mentioned the concept of shared value between firms and consumers, and Lyons (2013) pointed out that firms need to address stakeholder relationships to be competitive. Thus, new energy vehicles come from the concept of how the seller and the buyer can create a shared value and share the value between the two parties.

Second, the H2 shows that emotional advertising appeal positively correlates to self-determination. Huertas and Campomar (2009) pointed out that emotional advertisements must provide more experience and enjoyment to the consumer. Mehta and Purvis (2006) analyzed eighty advertisements and found that emotional advertisements evoked memories of consumers buying a new car. Albers-Miller and Stafford (1999) mentioned that emotional advertising appeals to consumers more than other methods. Therefore, emotional advertising can further reach consumers' shopping needs.

Third, the H3 emotional discourse has a positive significant correlation to self-determination. Markman and McMullen (2003) mentioned that emotional discourse connection can provide consumers with a good quality of life. Joel et al. (2019) suggested that some people feel remorseful. Therefore, we can understand that the buyer and seller become critical success factors in an emotional dialogue connection. Furthermore, advertising is sweet-talking from seller to seller, a process that culminates in the buyer identifying with the content of the seller's advertisement.

Fourth, the H4 shows that self-determination has a positive significant correlation with consumer loyalty. Han and Hyun (2017) mentioned that consumer loyalty comes from the quality of the seller's service, while Cronin and Taylor (1992) mentioned that consumers' perception of post-purchase service affects overall loyalty. Kettinger and Lee (2005) also emphasized that the quality of service affects consumer loyalty. Consumers make their own decisions during the consumption process and decide whether or not to stay in a long-term partnership with the seller. The relationship between the two parties will continue to be the ultimate loyalty relationship.

7. Conclusion and future research

7.1 Limit

We used an online questionnaire and a star survey to target consumers of new energy vehicles. Notably, there are limitations in collecting surveys, including duplicate IP locations. We determined whether the same email or name was used to remove invalid questions. In particular, we removed invalid questionnaires by looking at the type of questionnaires and determining whether the same answer was used or whether the questionnaires were filled in randomly. On the other hand, due to the influence of resources, workforce, material, and financial resources, there are still shortcomings in the research process. It is suggested that subsequent researchers modify and innovate this idea in the design.

7.2 Future research

We suggest that future researchers further extend the comparison between other European and American countries or some developed countries and China, including Scandinavia, the United States, Canada, Japan, and other related countries. Further comparisons between foreign countries and China will be of great research value and contribution. In the future, research can be combined with different fields, such as information technology, consumer behavior, marketing, information management, AI, and other fields, for cross-disciplinary investigation. This way, we can continue to make significant breakthroughs and innovations in new thinking. These points of view can be referred to and considered by subsequent researchers.

Data availability statement

Our data comes from a questionnaire survey designed by ourselves, which belongs to first-hand information.

Conflict of interest

Our article has no conflict of interest.

Ethical Statement

Our research does not involve animal and human experiments; we investigate consumer behavior.

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