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Impact of Brand Collaboration on Consumers' Purchase Intention of New Energy Vehicles

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Abstract

This study constructs a "Brand Collaboration - Consumer Perceived Value - Purchase Intention" model based on the Stimulus - Organism - Response (SOR) theory, examining the role of brand collaboration in the new energy vehicle market across three dimensions: collaborative brand awareness, resource complementarity, and technological visibility of co-branded products. An empirical analysis of questionnaire data reveals that brand collaboration significantly enhances consumers' perceptions of a product's functional value, thereby strengthening their purchase intentions. Furthermore, the study confirms the mediating role of consumer perceived value between brand collaboration and purchase intention. By employing a data-driven approach, the research identifies specific pathways through which brand collaboration boosts market competitiveness, offering both theoretical foundations and practical insights for enterprises seeking to optimize their marketing strategies.

Keywords: *Brand Collaboration, New Energy Vehicle Purchase Intention, Technological Visibility, Consumer Perceived Value*

1. Introduction

Following two decades of policy iteration and technological breakthroughs, China's new energy vehicle industry has gradually evolved into a globally leading industrial ecology. Since the initiation of the "863 Program" in 2001, the policy has been unambiguous. The initial phase of this initiative entailed the establishment of a technology system comprising three verticals (fuel cells, hybrid, and pure electric vehicles) and three horizontals (power batteries, drive motors, and multi-energy systems). Subsequent to the establishment of this initial framework, the Chinese government initiated a series of subsidy policies in 2015, with the objective of incentivizing consumers to acquire new energy vehicles. From 2020 to the present, China has been pursuing the goal of "double carbon" through marketization, resulting in a steady increase in the market penetration rate of new energy vehicles.

With respect to China's new energy vehicles, the prevailing environment is undergoing a rapid transition from a policy-driven to a market-driven model. Consequently, traditional automotive manufacturers must enhance their market competitiveness through technological collaboration. By collaborating, automotive manufacturers can leverage their partners' brand reputation, market resources, and technological advantages to enhance product market recognition, reduce the barriers to consumer brand recognition, and consequently influence consumer purchase decisions. In the context of China's ongoing intelligent transformation, traditional automotive manufacturers must strategically assess and determine the most suitable partners in the domain of new energy vehicles, while also assessing the efficacy of brand collaborations.

This study selects collaborative vehicle models with high market popularity and annual production exceeding 50,000 units in the Chinese market as research samples. Data collection reveals involvement from 10 automotive brands, whose current collaboration status will be briefly outlined.

HUAWEI has categorized its cooperation into three models. The component supply model: Acting as a Tier 1 supplier to provide modular solutions. BYD's Fang Cheng Bao Leopard 8 is equipped with HUAWEI ADS 3.0 system, while GEELY's GEOME G6 and M6 feature HarmonyOS 3.0 intelligent cockpit.

The HI model (Huawei Inside): Offering full-stack intelligent solutions. BAIC's ARCFOX Alpha S-HI version adopts the MDC 810 computing platform, enabling navigation-assisted driving in 20 cities including Beijing and Shanghai. CHANGAN's AVATR 11 and 12 models integrate HUAWEI's three-electric system and intelligent driving technology alongside ADS 3.0.

Harmony Intelligent Mobility model: HUAWEI has deeply engaged in product definition and channel operations, with SERES's AITO series achieving 385,900 deliveries in 2024. Notably, the M9 model secured over 50,000 orders in December alone. The jointly developed STELATO S9 with JAC, priced from 450,000 yuan, garnered 10,000 orders within 72 hours of pre-sale launch.

BAIDU and GEELY co-created JIYUE: Utilizing Apollo autonomous driving system and ERNIE AI model, models 01 and 07 feature NOA (Navigation on Autopilot) capabilities. IM Motors, jointly established by Alibaba Group, SAIC Motor and ZJINNOPARK: The L6 model equipped with NVIDIA chips and Alibaba Cloud system maintains stable monthly sales around 4,000 units, though market penetration remains limited. The joint endeavor between SAIC Motor, ZJINNOPARK, and Alibaba on the IM: The L6 model equipped with NVIDIA chips and Alibaba Cloud system maintains stable monthly sales around 4,000 units, though market penetration remains limited.

This study compiles 2024 sales data of collaborative new energy vehicle brands in China, focusing on commercially available mass-production models with annual sales exceeding 1,000 units. Compared with JIYUE single autonomous driving solution and IM Motors necessitates multi-party capital-driven development, HUAWEI has established comprehensive "chip-algorithm-cloud service" capabilities. The AITO M9 incorporates HarmonyOS 4.0 and the latest ADS 3.0 system. Successful industrial transformation cases like SERES whose market value surged from 12 billion yuan to 240 billion yuan through Harmony Intelligent Mobility collaboration - demonstrate traditional automakers' partnership effectiveness. This research focuses on how traditional automakers brand collaboration influence purchasing intention.

The new energy vehicles examined in this paper can be categorized into four distinct classifications: battery electric vehicles (BEV), hybrid electric vehicles (HEV), plug-in hybrid electric vehicles (REEV), and hydrogen fuel cell vehicles (FCEV). The traditional automakers examined in this paper refer to entities that historically dominated the era of fuel vehicles and possess a comprehensive fuel vehicle research and development and production system. These companies have a century-long history, including international brands such as Ford, Mercedes-Benz, and Toyota, as well as Chinese state-owned or joint ventures like FAW, SAIC, and GAC.

In their 2016 study, Kotler and Keller demonstrate the moderating effect of external factors, including product attributes, brand image, and price sensitivity, on purchase intention. As a high-value durable consumer product, the automobile is distinct from general fast-moving consumer goods, and its purchase decision-making process is more complex and cumbersome. A study based on the Stimulus-Organism-Response (SOR) theory (Guofang, Qi & Lin., 2023) constructed a model that included technical attributes such as intelligence, connectivity, and safety. The study's findings suggest that the safety, connectivity, and intelligence levels of new energy vehicles positively influence purchase intention by enhancing consumers' perceived trust. Among these factors, perceived usefulness emerged as the most significant predictor, underscoring consumers' valuation of the practical benefits that new energy vehicles offer for daily transportation needs. In a comparative study of three types of electric vehicle brands (joint ventures, independent brands, and new car making powers), Liu, Huang, Lin, Li, Yang and Zheng (2024) found that, regardless of the category, brand awareness and brand collaboration strategies influence consumer purchase decisions. This finding suggests that in the new energy vehicle market, consumers not only evaluate the vehicle itself, but also the added value and credibility endorsement brought about by the cooperative relationship between brands.

In a seminal paper, Reitz, Pfeffer and Salancik (1979) advanced the notion that companies can establish complementary advantages through brand collaboration, thereby reducing their reliance on external resources. Spence (1973) signaling theory offers an explanatory framework for the brand collaboration, positing that such cooperation can serve as a signal of quality or value to the market. A notable illustration of this phenomenon is the collaboration between Sailith and Huawei, which represents a distinctive instance of inter-industry brand collaboration. A study by Yanfeng, Ying and Shaona (2021) demonstrates that the greater the discrepancy in attributes of the cooperative product, the lower the consumer's evaluation of the cooperative product and the lower the willingness to purchase. This suggests that while cross-industry collaboration is a novel concept, it is also susceptible to challenges related to consumer perceptions. Conversely, cross-industry collaboration also brings about unprecedented opportunities for functional complementarity. New energy vehicles, being both innovative and technology-intensive, exemplify this complexity. However, Swaminathan, Sorescu, Steenkamp, O'Guinn and Schmitt (2020) have indicated that

in brand collaboration within technology-intensive domains, functional complementarity exerts a more substantial influence on enhancing consumer purchase propensity compared to purely image-based complementarity.

From the perspective of the resource-based view, brand collaboration is also one of the ways for companies to obtain external key resources and build competitive advantages. The theory of relational competitive advantage, proposed by Dyer and Singh (1998), also underscores the significance of resource synergy between partners. The key resources of enterprises can be embedded in interconnected relationships, and lasting competitive advantages can be established through elements such as relationship-specific assets, knowledge-sharing practices, complementary resources, and effective governance mechanisms. Of these, complementary resources are regarded as a pivotal origin of sustained competitive advantage from brand collaboration.

The present study explores the signaling effect of brand collaborations on consumers. Brand collaborations have been shown to generate synergies at the corporate level, as well as to influence perceptions and decisions at the consumer level through various signals. A seminal study by Gammoh, Voss, and Chakraborty (2006) demonstrated that brand collaborations exert a significant influence on consumer perceptions and brand evaluations through the concept of "brand collaboration signals."

In the context of brand alliances for high-tech products, technical factors assume a particularly salient role as a signal. As Ling and Changliu (2012) have demonstrated in their research, consumers exhibit a greater propensity to accept brand combinations that exhibit high technical compatibility than to rely exclusively on brand influence. Furthermore, technical fit has been found to play a more significant role in consumer recognition than brand awareness. To illustrate this point, consider the example of the new energy vehicle market. Consumers are more likely to recognize a partnership such as that between Tesla and Panasonic because Panasonic's technological advantage in the field of batteries significantly enhances consumers' trust in the battery performance of the cooperative model.

Explicit cooperation presentation and technical visibility are critical factors in brand perception. In addition to the brand name and the technical match itself, the manner in which brand collaboration is presented to consumers also affects their perception. Furthermore, Kirmani and Rao (2000) seminal study, viewed through the lens of signal theory, posits that high-cost brand collaborations, large-scale joint marketing endeavors, and in-depth technical collaborations can augment the perceived credibility of product quality, thereby exerting a significant influence on consumer purchase decisions.

In recent years, scholars have made significant strides in their understanding of the dimensions that comprise perceived value. Sweeney and Soutar (2001) seminal contribution proposed a four-dimensional model of perceived value for consumer durables, encompassing functional value, emotional value, social value, and perceived cost. This model has been expanded to encompass the domain of high-value durable consumer goods, including automobiles, among other applications. Pei, Xu, Xu, and Wang (2024) employed a range of methodologies, including particle swarm optimization support vector machines, to examine the factors influencing the sales of various new energy vehicle brands and to identify the pivotal decision-making factors within each market segment. The study's findings underscored the significance of functional attributes of vehicles in influencing consumer decisions, irrespective of the brand or market segment.

In the domain of new energy vehicles, the mechanism of perceived value mediation in the context of brand collaboration exhibits particularities. According to Swaminathan et al. (2020), when the technical complementarity of collaborating brands exceeds a certain threshold, the mediating effect of perceived value on purchase intention is significantly enhanced.

In accordance with the extant literature, this study synthesizes the perspectives of brand collaboration theory and the resource-based view, and decomposes the brand collaboration into three key dimensions: collaborative brand awareness, resource complementarity, and technological visibility of co-branded products. These three dimensions encapsulate the varied effects of brand collaboration on consumers. Awareness is indicative of the trust endorsement brought about by brand reputation. Complementarity reflects the functional improvement brought about by the combination of resource capabilities. Visibility reflects the experiential value brought about by the presentation of new technologies.

2. Objectives

1)To analyze the influencing factors that brand cooperation on purchase intention.
2)To analyze the mechanism by which brand collaboration affects consumer perceived value.
3)To analyze the mediating role of consumer perceived value between brand collaboration and purchase intention.

3. Materials and Methods

The customer perceived value model proposed by Sweeney and Soutar (2001) divides perceived value into four dimensions: functional value, emotional value, social value, and perceived cost. Functional value refers to consumers' perception of the practicality and performance of a product; emotional value involves consumers' emotional experience of a product; social value reflects the impact of a product on consumers' social status or image; and perceived cost includes the monetary and non-monetary costs perceived by consumers during the purchase process.

Given that the research object of this paper is new energy vehicles, and the core of brand collaboration lies in technological empowerment, the paper explores the mediating role of consumer perceived value between brand collaboration and purchase intention from the functional value dimension. This is particularly salient in the context of new energy vehicle consumption, as consumers exhibit heightened sensitivity to technical attributes such as driving range, intelligence, and charging convenience. These attributes directly influence consumers' perception of the practicality of the product.

This paper further combines the SOR theory to construct a model of the mechanism of action of "brand collaboration - consumer perceived value - Purchase Intention". The SOR theory posits that external stimuli (Stimulus) ultimately lead to behavioral responses (Response) by influencing the internal state (Organism) of individuals. In this study, the brand collaboration: comprising collaborative brand awareness, resource complementarity, and technological visibility of co-branded products, as external stimuli-exerts an influence on the functional value of consumers' perceived value, which in turn affects their purchase intention.

The brand collaboration exerts a substantial influence on consumer perceived value (H1).
The brand collaboration exerts a substantial influence on consumer purchase intention (H2).
The mediating role of perceived value in the brand collaboration and consumer purchase intention is further substantiated by hypothesis (H3).

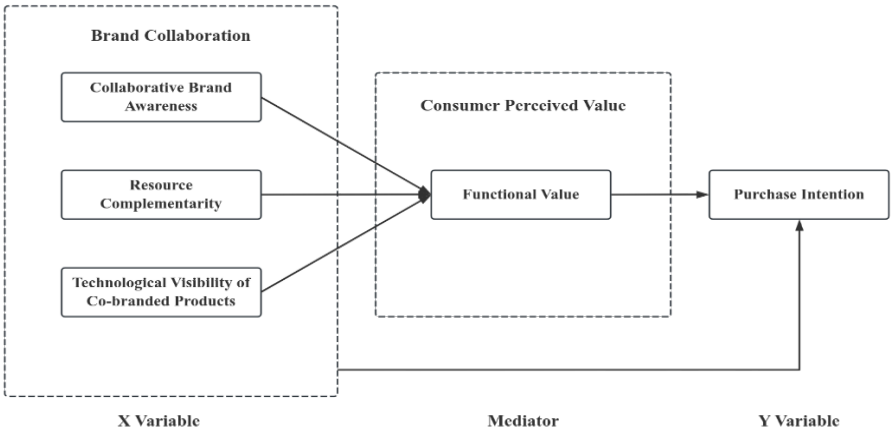

Figure 1 Theoretical Model

The data analysis was executed using SPSS and AMOS to ascertain the correlation between the level of adaptation and its influencing factors. This process entailed the implementation of various analytical techniques, including descriptive statistics, reliability analysis, validity analysis, correlation analysis, regression analysis, and mediation effect testing. The reliability analysis encompassed validity testing,

exploratory factor analysis, and AVE (average variance extracted) testing for aggregate and discriminant validity.

4. Results

To facilitate subsequent research and analysis, we will briefly introduce the three dimensions of brand collaboration: collaborative brand awareness, resource complementarity, and technological visibility of co-branded products - in subsequent articles, denoted by awareness, complementarity, and visibility, respectively.

The distribution of questionnaires was anticipated to yield 300 responses; however, 415 were received. The initial question of the questionnaire served as a screening instrument, and after the exclusion of questionnaires that yielded a "no" response, the final sample size was determined to be 405. Following the elimination of three questionnaires that exhibited anomalous data, the final sample comprised 402 valid questionnaires, yielding a recovery rate of 96.9%. The collected questionnaire survey data is deemed valid.

Table 1 Demographic characteristics of the sample (N=402)

Statistical Variable	Sort	Frequency	Percentage
Gender	Male	193	48%
	Female	209	52%
Age	Under 30 years old	185	46%
	31-50 years old	114	28.4%
	50 years old or above	103	25.6%
Education Level	Junior college degree and less	127	31.6%
	undergraduate course	124	30.8%
	master's degree and above	151	37.6%
Careers	private owner	88	21.9%
	General staff	92	22.9%
	Government Employee /Career Employee	105	26.1%
	(sth. or sb) else	117	29.1%
Annual income	Less than 100,000	151	37.6%
	100,000-200,000	118	29.4%
	200,000 or more	133	33.1%
Car purchase budget	Less than 100,000	187	46.5%
	100,000-200,000	72	17.9%
	200,000-300,000	57	14.2%
	300,000-500,000	43	10.7%
	500,000 or more	43	10.7%

Source: Author's processing.

The collected variables are described, with the primary objective being to ascertain the degree of concentration and volatility of the data. The author opted to calculate the minimum, maximum, average, standard deviation, and median of each variable. The design of the research scale employed a five-point Likert scale, with the numbers 1-5 denoting the attitude of the respondent towards the questions in the questionnaire, ranging from "strongly disagree" to "strongly agree."

Table 2 Descriptive statistics of the variables

Variant	N	Minimum Value	Maximum Values	Average Value	(Statistics) Standard Deviation	Upper Quartile
Awareness	402	1.000	5.000	3.3607	1.32586	4.0000
Complementarity	402	1.000	5.000	3.3843	1.30484	4.2500
Visibility	402	1.000	5.000	3.5041	1.32671	4.3333
Perceived Value	402	1.000	5.000	3.5547	1.28180	4.3333
Purchase Intention	402	1.000	5.000	3.3698	1.35633	4.1667

Source: Author's processing.

A thorough evaluation of the descriptive statistics tables reveals that the dataset under scrutiny contains no anomalous values. Furthermore, the mean value of each variable falls within the bounds of acceptability, thereby suggesting that the collected data is of satisfactory quality and can be reliably employed for subsequent analytical procedures.

The primary objective of reliability analysis is to ascertain the consistency of the collected questionnaire data. Conducting subsequent empirical research is only possible through the implementation of reliability analysis. In this study, Cronbach's α coefficient is employed for the purpose of reliability testing, with the understanding that the outcomes of such testing generally vary within the interval from 0 to 1. When Cronbach's α coefficient attains a value greater than or equal to 0.9, it is indicative of excellent reliability for the measurement scale under consideration. Conversely, a value greater than or equal to 0.8 and less than 0.9 signifies good reliability, while a value greater than or equal to 0.A reliability ratio of 0.7 or less and 0.8 or more indicates that the measurement scale employed in this study is acceptable. A ratio of less than 0.7 indicates that the measurement scale should be treated with caution, while a ratio greater than 0.95 indicates that the scale is overly reliable and should be treated with caution. The specific results of the reliability analysis in this study are as follows:

Table 3 Results of Cronbach's alpha coefficient analysis of study variables

Variant	Entry (In a Dictionary)	Cronbach's alpha Coefficient
Brand Collaboration	10	.854
Awareness	3	.917
Complementarity	4	.944
Visibility	3	.933
Perceived Value	3	.922
Purchase Intention	3	.932
Scale as a whole	16	.890

Source: Author's processing.

The empirical findings indicate that the α coefficient of the brand collaboration is 0.854, the α coefficient of perceived value is 0.922, the α coefficient of purchase intention is 0.932, and the α coefficient of the overall scale is 0.890. The reliability of the research variables is maintained above 0.8, indicating good reliability and allowing for the next step of analysis.

The primary objective of validity analysis is to assess the validity of the questionnaire. In this study, the validity of the questionnaire used will be tested to determine its validity. To this end, the KMO and Bartlett's sphericity test were employed to assess the questionnaire's validity. A KMO value greater than or equal to 0.6 indicates acceptable validity, 0.8 or higher indicates good validity, and less than 0.5 indicates unsuitability for factor analysis. The Bartlett sphericity test requires a p-value less than 0.05, indicating a high degree of correlation among the variables. The specific results of the validity analysis of this study are as follows:

In order to calculate the validity of the brand collaboration as a dependent variable, the author utilized all of the item data from the three sub-dimensions of awareness, complementarity, and visibility to

calculate the validity of the brand collaboration. The validity analysis of the brand collaboration is presented in Table 4 The KMO value of the brand collaboration effect is 0.836, which is significant. This indicates that brand collaboration is suitable for factor analysis.

Table 4 Brand Collaboration KMO Values and Bartlett's Spherical Tests

KMO Value		0.836
Bartlett's test of Sphericity	Approximate chi-square (math.)	3429.577
	(Number of) Degrees of Freedom (Physics)	45
	Significance	.000

Source: Author's processing.

The validity analysis of perceived value is illustrated in Table 5 The KMO value of perceived value is 0.762, which is significant. Therefore, it can be concluded that perceived value is suitable for factor analysis.

Table 5 Perceived Value KMO values and Bartlett's test of sphericity

KMO value		0.762
Bartlett's test of Sphericity	Approximate chi-square (math.)	901.092
	(Number of) Degrees of Freedom (Physics)	3
	Significance	<.001

Source: Author's processing.

The validity analysis of purchase intention is illustrated in Table 6 The KMO value of perceived value is 0.768, which is significant. Therefore, it can be concluded that purchase intention is suitable for factor analysis.

Table 6 Purchase Intention KMO Values and Bartlett's Sphericity Test

KMO value		0.768
Bartlett's test of Sphericity	Approximate chi-square (math.)	985.672
	(Number of) Degrees of Freedom (Physics)	3
	Significance	<.001

Source: Author's processing.

The KMO value and Bartlett's spherical test were passed for all measured variables above. Given the absence of a recognized scale for the visibility component of this study, an exploratory factor analysis (EFA) was conducted. The items were then subjected to further purification, and the dimensionality was reviewed. The rationality of the structure was then tested.

Table 7 Component matrix after rotation

Name (of a thing)	Factor Loading Factor		
	Factor 1	Factor 2	Factor 3
Awareness 1			.917
Awareness 2			.917
Awareness 3			.908
Complementarity 1	.911		
Complementarity 2	.905		
Complementarity 3	.916		
Complementarity 4	.921		
Visibility 1		.922	

Name (of a thing)	Factor Loading Factor		
	Factor 1	Factor 2	Factor 3
Visibility 2		.933	
Visibility 3		.920	
Variance explained % (after rotation)	34.19%	26.52%	25.87%
Cumulative variance Explained % (after rotation)	34.19%	60.71%	86.58%
KMO value		0.863	
P-value		.000	

Source: Author's processing.

Given that the dimension of "technological visibility of co-branded products" does not utilize a mature scale, this study conducts an exploratory factor analysis of the brand collaboration (including the three dimensions of awareness, complementarity, and visibility, a total of 10 items) to verify the structural validity of the measurement tool and the rationality of the items. Principal component analysis was employed to extract factors, and factor rotation was executed using the maximum variance method. The number of factors was determined based on the criterion that the eigenvalue was greater than 1.

As demonstrated in Table 7, the factor analysis results indicate that the factor load coefficients of each item exceed the minimum threshold of 0.90 (0.908–0.917 for the awareness dimension, 0.905–0.921 for the complementarity dimension, and 0.920–0.933 for the visibility dimension). Furthermore, the analysis reveals the absence of cross-factor loading. The three factors collectively account for 86.58% of the variance, with factor 1 (complementarity) accounting for 32.19%, factor 2 (visibility) accounting for 26.52%, and factor 3 (awareness) accounting for 25.87%. This indicates that the measurement tool possesses a substantial explanatory power regarding the structure. The KMO value is 0.836, and the Bartlett spherical test is significant ($p<0.001$), satisfying the conditions for factor analysis.

The analysis yielded results that demonstrated a high degree of agreement with theoretical predictions. Specifically, the three items on awareness converged on factor 3, the four items on complementarity converged on factor 1, and the three items on visibility converged on factor 2. This finding serves to verify the three-dimensional structural division of the brand collaboration. The analysis revealed that none of the items exhibited a load value below 0.5 or exhibited multiple cross-loadings. This finding indicates that the scale possesses a clear factor structure and that the deletion of items or adjustments to dimensions are unnecessary. This finding serves to substantiate the validity of the visibility scale and concomitantly enhances the scientific rigor of the overall measurement model.

The methodology employed to calculate the AVE value and discriminant validity of each dimension entails the initial calculation of the variables for each dimension to obtain the mean value of each dimension. Subsequent to this, the mean value of each dimension is utilized to calculate the AVE value and discriminant validity. The following three sub-dimensions, namely:awareness, complementarity, and visibility.These will all be calculated using the mean value of each dimension.

Table 8 Model AVE and CR indicator results

(Math.) Factor	Mean Variance Extraction AVE	Combined Reliability CR
Awareness	0.786	.917
Complementarity	0.808	.944
Visibility	0.822	.933
Perceived Value	0.798	.922
Purchase Intention	0.821	0.932

Source: Author's processing.

In this study, a total of five factors and sixteen items were analyzed. As illustrated in the above table, the AVE values of the five factors are all greater than 0.5, and the CR values are all greater than 0.7. This indicates that the data analyzed in this study possesses adequate convergent validity.

Table 9 Distinguishing Validity: Pearson Correlation and AVE Square Root Values

	Awareness	Complementarity	Visibility	Perceived value	Purchase Intention
Awareness	0.886				
Complementarity	0.230	0.899			
Visibility	0.232	0.260	0.907		
Perceived Value	0.333	0.379	0.317	0.893	
Purchase Intention	0.260	0.289	0.270	0.340	0.906

Source: Author's processing.

The discriminant validity is analyzed. For the construct of awareness, the square root of the AVE is 0.886, which exceeds the maximum absolute value of the inter-factor correlation coefficient of 0.333. This finding suggests that there is adequate discriminant validity. Similarly, for complementarity, the square root of the AVE is 0.899, which is greater than the maximum absolute value of the inter-factor correlation coefficient of 0.379, thereby also indicating good discriminant validity. The square root of the AVE is 0.907 for visibility, which is greater than the maximum absolute value of the correlation coefficient between factors of 0.317, indicating good discriminant validity. For perceived value, the square root of the AVE is 0.893, which is greater than the maximum absolute value of the correlation coefficient between factors of 0.379, meaning that it has good discriminant validity; for purchase intention, its AVE square root value is 0.906, which is greater than the maximum absolute value of the inter-factor correlation coefficient of 0.340, meaning that it has good discriminant validity.

A summary of the data results from the validity analysis section indicates that the model's validity analysis meets statistical requirements. Furthermore, it is evident that the measurement tools are valid and can reliably and effectively reflect the relationship between brand collaboration, perceived value, and purchase intention. This finding supports the reliability of subsequent empirical analysis.

This article utilizes Pearson's correlation analysis to assess the relationship between variables presented in the text. In the context of correlation analysis, the correlation coefficient is expected to fall within the interval [−1, 1]. A positive value indicates a same-direction change, while a negative value indicates an opposite-direction change. The magnitude of the absolute value of the value represents the strength of the correlation between the two. The absolute value of the correlation coefficient ranges from 0.1 to 0.3, indicating a weak correlation; from 0.3 to 0.5, indicating a moderate correlation; and above 0.5, indicating a strong correlation. The absolute value of the correlation coefficient approaches 1 as the strength of the correlation between the two variables increases. A p-value less than 0.01 indicates a highly significant result, a p-value less than 0.05 indicates a significant result, and a p-value greater than 0.05 indicates an insignificant result. The specific analysis data is shown in Table 10:

Table 10 Pearson Correlation Matrix Table

		Awareness	Complementarity	Visibility	Perceived Value	Purchase Intention
Awareness	Pearson Correlation	1.000				
	Significance (two-tailed)					
Complementarity	Pearson Correlation	.232**	1.000			
	Significance (two-tailed)	<.001				

		Awareness	Complementarity	Visibility	Perceived Value	Purchase Intention
Visibility	Pearson Correlation	.235**	.262**	1.000		
	Significance (two-tailed)	<.001	<.001			
Perceived value	Pearson Correlation	.336**	.381**	.319**	1.000	
	Significance (two-tailed)	<.001	<.001	<.001		
Purchase Intention	Pearson Correlation	.262**	.290**	.272**	.342**	1.000
	Significance (two-tailed)	<.001	<.001	<.001	<.001	

**. The correlation is significant at the 0.01 level (two-tailed).
Source: Author's processing.

As demonstrated in the above table, the correlation coefficients between all variables are positive, indicating a positive correlation between the variables. A thorough examination of the data in the aforementioned table reveals that the relationship between each variable is statistically significant. However, further determination of the relationship requires regression analysis.

This study utilizes regression analysis to verify the influence between each of the hypothetical variables. The preceding content has entailed a correlation analysis between each variable, which has led to the conclusion that each variable exerts a significant positive influence on the others. The subsequent section will utilize regression analysis to substantiate the hypotheses concerning the variables outlined in this study.

In the regression analysis, the brand collaboration and its three dimensions—awareness, complementarity, and visibility—are designated as independent variables, while perceived value is designated as the dependent variable in the analysis. A multiple regression analysis is performed, and the specific analysis data is shown in the table below:

Table 11 Regression Analysis of Brand Collaboration on Perceived Value - Model Summary

Mould	R	R-square	Adjusted R-square	Errors in Standardized Estimates	D-W value	F	Significance
1	0.493	0.243	0.237	1.27606	1.570	42.581	<.001

Source: Author's processing.

As demonstrated in Table 11, the R2 value is 0.243, and the D-W value is 1.570. These findings indicate that the multiple regression equation is suitable for analysis. The F value is 42.581, which is significant at p<.001, thereby indicating that the model structure is meaningful.

Table 12 Regression Analysis of Brand Collaboration on Perceived Value - Coefficients

Mould		Unstandardized Coefficient		Standardized Coefficient	t	Significance	VIF
		B	Standard Error	β			
1	(Constant)	2.083	.188		11.089	<.001	
	Awareness	.218	.044	.226	4.952	<.001	1.094
	Complementarity	.273	.045	.278	6.038	<.001	1.110
	Visibility	.187	.044	.193	4.198	<.001	1.112

Source: Author's processing.

The β value of the collaborative brand awareness is 0.226 (t=4952, p<.001, VIF<5), and the analysis result is significant, indicating that the awareness of the co-branding has a positive impact on the purchase intention of new energy vehicle consumers.

The β value of the resource complementarity is 0.278 (t=6.038, p<.001, VIF<5), and the analysis result is significant, indicating that the resource complementarity has a positive impact on the purchase intention of new energy vehicle consumers.

The β value of the technological visibility of co-branded products is 0.193 (t=4.198, p<.001, VIF<5), and the analysis result is significant, indicating that the technological visibility of co-branded products has a positive impact on the purchase intention of new energy vehicle consumers.

Table 13 Regression Analysis of Brand Collaboration on Consumer Purchase Intention - Model Summary

Mould	R	R-square	Adjusted R-square	Errors in Standardized Estimates	D-W value	F	Significance
1	0.391	0.153	0.146	1.25316	1.460	23.914	<.001

Source: Author's processing.

As demonstrated in Table 13, the R2 value is 0.153, and the D-W value is 1.460. These findings indicate that the multiple regression equation is suitable for analysis. The F value is 23.914, which is significant at p<.001, thereby indicating that the model structure is meaningful.

Table 14 Regression Analysis of Brand Collaboration on Consumer Purchase Intention - Coefficients

Mould		Unstandardized Coefficient		Standardized Coefficient	t	Significance	VIF
		B	Standard Error	β			
1	(Constant)	1.422	.239		5.959	<.001	
	Awareness	.176	.049	.173	3.574	<.001	1.094

Source: Author's processing.

Table 14 Regression Analysis of Brand Collaboration on Consumer Purchase Intention – Coefficients (Continued)

Mould		Unstandardized Coefficient		Standardized Coefficient	t	Significance	VIF
		B	Standard Error	β			
1	Complementarity	.212	.051	.204	4.190	<.001	1.110
	Visibility	.186	.050	.178	3.660	<.001	1.112

Source: Author's processing.

The β value of the collaborative brand awareness is 0.173 (t=3.574, p<.001, VIF<5), and the analysis result is significant, indicating that the awareness of the cooperative brand has a positive impact on the purchase intention of new energy vehicle consumers.

The β value of the resource complementarity is 0.204 (t=4.190, p<.001, VIF<5), and the analysis result is significant, indicating that the resource complementarity has a positive impact on the purchase intention of new energy vehicle consumers.

The β value of the technological visibility of co-branded products is 0.178 (t=3.660, p<.001, VIF<5), and the analysis result is significant, indicating that the technological visibility of co-branded products has a positive impact on the purchase intention of new energy vehicle consumers.

Table 15 General Model Mediation Effects Tests

	Classifier for Principles, Items, Clauses, Tasks, Research Projects etc	Efficiency Value	Boot Standard Error	BootCI Lower Limit	BootCI Limit	p	Relative Effect Value
Direct Effect	Brand Collaboration ⇒ Purchase Intention	0.426	0.076	0.278	0.575	.000	75%
Intermediary Effect	Brand collaboration⇒ Perceived Value⇒Willingness to Buy	0.142	0.043	0.070	0.237	.000	25%
Aggregate Effect	Brand Collaboration ⇒ Purchase Intention	0.067	0.067	0.436	0.700	.000	

Source: Author's processing.

In this study, the Bootstrap sampling test method was employed for the mediating effect test. Following the completion of 5,000 samplings, the final result is presented in Table 15. The BootCI interval values are all positive, indicating that perceived value plays a mediating role in the process of the brand collaboration influencing purchase intention. The direct effect influence effect is 75%, while the indirect effect influence effect is 25%.

Table 16 Mediation effect test and effect decomposition table for perceived value (awareness)

	Classifier for Principles, Items, Clauses, Tasks, Research Projects etc	Efficiency Value	Boot Standard Error	BootCI Lower Limit	BootCI Limit	p	Relative Effect Value
Direct Effect	Awareness ⇒ Purchase Intention	0.169	0.050	0.070	0.268	.000	63.30%
Intermediary Effect	Awareness ⇒ Perceived Value ⇒ Purchase Intention	0.098	0.025	0.056	0.153	.000	36.70%
Aggregate Effect	Brand Collaboration Awareness ⇒ Purchase Intention	0.267	0.049	0.171	0.365	.000	

Source: Author's processing.

Assuming that the independent variable is the collaborative brand awareness, the BootCI interval values of perceived value are all positive, which indicates that perceived value plays a partial mediating role in the process of collaborative brand awareness influencing purchase intention. The direct effect is 63.30%, and the indirect effect is 36.70%.

Table 17 Mediation effect test and effect decomposition table for perceived value (complementarity)

	Classifier for Principles, Items, Clauses, Tasks, Research Projects etc	Efficiency Value	Boot Standard Error	BootCI Lower Limit	BootCI Limit	p	Relative Effect Value
Direct Effect	Complementarity ⇒ Purchase Intention	0.195	0.052	0.093	0.297	.002	64.57%
Intermediary Effect	Complementarity ⇒ Perceived Value ⇒ Purchase Intention	0.107	0.026	0.060	0.164	.000	35.43%
Aggregate Effect	Complementarity ⇒ Purchase Intention	0.302	0.050	0.204	0.400	.000	

Source: Author's processing.

Assuming that the independent variable is the degree of resource complementarity, the BootCI interval values for perceived value are all positive, which indicates that perceived value plays a partial mediating role in the process of the degree of resource complementarity affecting purchase intention. The direct effect is 64.57%, and the indirect effect is 35.43%.

Table 18 Mediation effect test and effect decomposition table for perceived value (visibility)

	Classifier for Principles, Items, Clauses, Tasks, Research Projects etc	Efficiency Value	Boot Standard Error	BootCI Lower Limit	BootCI Limit	p	Relative Effect Value
Direct Effect	Visibility ⇒ Purchase Intention	0.185	0.050	0.083	0.284	.000	66.79%
Intermediary Effect	Visibility ⇒ Perceived Value ⇒ Purchase Intention	0.092	0.023	0.051	0.142	.002	33.21%
Aggregate Effect	Brand Collaboration Visibility ⇒ Purchase Intention	0.277	0.049	0.181	0.375	.000	

Source: Author's processing.

The technological visibility of co-branded products was selected as the independent variable. The BootCI interval values of perceived value were found to be positive, indicating that perceived value plays a partial mediating role in the process of technological visibility of co-branded products affecting purchase intention. The direct effect is 66.79%, and the indirect effect is 33.21%.

5. Conclusion

This paper proposes a model of "brand collaboration - consumer perceived value - purchase intention" based on the stimulus - organism - response (SOR) theory. The model focuses on the impact mechanism of three dimensions of collaborative brand awareness, resource complementarity and technological visibility of co-branded products on consumer purchase intention. It also analyzes the mediating role of consumer perceived value. Through the implementation of questionnaire surveys and empirical analysis, the significant effect of brand collaboration on consumer purchase intention and the mediating effect of perceived value are verified. The primary research conclusions of this paper are as follows.

The empirical analysis of the present study, based on the aforementioned questionnaire, yielded the following results: Specifically, in the context of new energy vehicles, the strategic selection of suitable cross-industry brands for collaborative marketing initiatives has been demonstrated to substantially augment consumers' perceived value, thereby fostering an enhanced propensity to procure these vehicles. The advantages brought about by brand collaboration are particularly significant in terms of functional value, as it can enhance consumers' satisfaction with the performance and quality of the cooperative products, reduce their perceived risk, and thus promote their purchase decision.

The study's findings indicate that consumer perceived value plays a partial mediating role in the process of brand collaboration influencing purchase intention. The present study focuses primarily on the study of functional value. The empirical evidence collected indicates that consumers place greater emphasis on the enhancement of product technical performance that results from brand collaboration. The findings reveal that brand collaboration exerts an indirect influence on purchase intention through perceived value, in addition to a direct impact path. In particular, the visibility of technology has a significant direct effect on purchase intention, indicating that consumers' immediate recognition of obvious technical highlights can bypass the value assessment process, directly triggering their purchase behavior. This suggests that stimuli derived from brand collaborations, such as significant technological breakthroughs and ongoing technological updates, can directly stimulate consumer interest and augment purchase intention.

6. Limitations and Future Research Directions

6.1 Limitations

While the present study accomplished its stated objectives, there are still some limitations that must be overcome and improved upon in subsequent studies. The most salient issue pertains to the inadequate scope of the sample. The survey sample of this study focuses primarily on consumers in developed first- and second-tier cities in China, with relatively little attention paid to consumers of new energy vehicles in third- and fourth-tier cities and rural markets. This failure to include new energy vehicle consumers in the survey sample results in an inability to fully reflect the differentiated responses of consumers in different market segments to brand collaboration. This limitation may compromise the generalizability of the study's findings. Secondly, the absence of policy variables is notable. The research model does not incorporate policy factors relevant to the new energy vehicle industry and their impact on consumer behavior. The policy environment is a salient factor in China's new energy vehicle market, and the exclusion of these external factors may lead to an underestimation of the moderating effect of policy on consumer purchase intentions.

6.2 Future Research Directions

A longitudinal study of brand collaborations should be conducted to assess the impact on consumer behavior across different stages of the collaboration lifecycle. A longitudinal study of the various stages of brand collaborations is recommended to facilitate a comparison of the differences in the impact on consumer behavior between the early stage and the mature stage of the collaboration. By dynamically tracking the changes in brand collaborations over time, companies can gain a clearer understanding of the sustainability and phased nature of the effects of collaborations. This, in turn, provides a basis for formulating corresponding strategies for different stages.

A comparative analysis of cultural markets in other countries is warranted. In the future, a comparative analysis of consumer responses to brand collaborations in different countries and cultural contexts will be possible. A subsequent analysis will examine whether there are significant differences in the sensitivity of consumers in the Chinese market and those in European and American markets to factors such as "technical visibility" This comparative cultural analysis will provide valuable reference points for new energy vehicle enterprises to carry out brand collaborations on a global scale, adjust their collaboration strategies according to the characteristics of regional markets, and improve the benefits of global collaborations.

It is imperative to deliberate upon the repercussions of policy factors. In light of the substantial influence of the policy environment on the promotion of new energy vehicles, future research endeavors should incorporate external factors, such as changes in subsidy policies and national-level strategies, into the analytical framework. By examining the moderating effect of policy factors on the relationship between the effect of brand collaboration and consumer purchase intention, the impact of the external environment on consumer decision-making can be more comprehensively assessed. This, in turn, will make the research conclusions more closely aligned with real-world situations.

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