Research on the Influencing Mechanism of Consumers' Fruit and Vegetable Consumption Willingness Based on Regression Analysis and Mediation Model

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Abstract: At a time when new media marketing is developing rapidly and green consumption is receiving much attention, it is crucial to explore the influencing mechanism of consumers' green consumption willingness. Based on 418 consumer questionnaires, this paper conducts an empirical analysis, adopts regression analysis and mediation moderation model, and conducts an empirical study on how factors such as green value perception (GV), consumer trust (TR), and environmental identity (EI) affect green consumption willingness (PI). The results show that green value perception has a significant positive impact on green consumption willingness, trust mechanism plays a partial mediating role between green value perception and green consumption willingness, environmental identity plays a significant positive moderating role in the path of green value perception affecting trust mechanism, high environmental identity can strengthen the above relationship. In the Johnson-Neyman analysis results, when EI>3.16, the effect is significant, the conclusions of this study provide theoretical reference and practical guidance for enterprises to formulate green marketing strategies and enhance consumers' green consumption willingness in new media marketing scenarios.

1. Introduction

Under the tide of the times where the global sustainable development strategy is continuously deepening and advancing, environmental protection and sustainable development have become the focus of global common concern. Green consumption, as a new consumption model that conforms to the concept of environmental protection, is gradually becoming an important way for consumers to practice environmental protection responsibilities and promote social sustainable development. By choosing green products, consumers can not only meet their own needs, but also reduce the negative impact on the environment during consumption, helping to achieve the coordinated development of economy, society and environment.

At the same time, the new media marketing field is showing a booming trend. Digital communication methods such as short videos, social media, and live e-commerce have sprung up like mushrooms after rain, and are changing the pattern of information dissemination and consumer behavior patterns at an unprecedented speed. These new media platforms, with their strong communication power, wide coverage and high interactivity, provide new channels and broad space for the promotion of green products, profoundly affecting consumers' cognition, attitude and final consumption decisions of green products.

However, despite the increasing market supply of green products, consumers' willingness to consume green products shows significant differences. Some consumers actively respond to the concept of green consumption and are willing to pay a premium for green products, while other consumers are on the sidelines of green products and even lack the willingness to buy them. This difference not only restricts the further expansion of the green product market, but also affects the progress of achieving sustainable development goals.

In this context, it is particularly urgent and important to deeply explore the formation mechanism of consumers' green consumption willingness under the new media marketing model. By revealing

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the key factors affecting consumers' green consumption willingness and their action paths, it can provide scientific theoretical guidance and practical strategies for all parties such as governments, enterprises and platforms, so as to effectively promote the development of the green market, increase the market penetration rate of green products, promote the widespread popularization of green consumption behaviors, and help the smooth realization of the sustainable development goals of the "14th Five-Year Plan".

Under the new media operation model, the research on the mechanism affecting consumers' green consumption willingness has attracted much attention, and domestic and foreign research shows a situation where commonalities and differences coexist.

In terms of commonalities, domestic and foreign research attaches great importance to the application of theoretical foundations and uses classical theories to deeply analyze consumer behavior. For example, the theory of planned behavior (TPB) proposed by Ajzen [1] emphasizes that consumers' green consumption willingness is driven by attitudes, subjective norms and perceived control. At the same time, they all focus on the role of new media communication content, form and external factors on consumers' green consumption willingness. For example, the "perceived control" of TPB can be manifested as consumers' ability to screen information in the new media environment.

In recent years, foreign scholars have tried to integrate the two to better explain green behavior. For example, Barbarossa [2] introduced the "environmental identity" variable when studying the adoption of electric vehicles and found that it has a significant moderating effect on behavioral intention. (Kumar[3] pointed out in his research on sustainable food that the high experience of green products makes consumers more dependent on the interaction and trust mechanism in new media rather than traditional brand endorsement. Zaidi et al.[4] explored the influence of consumption values on green purchase intention, and their findings on the moderated mediation role of greenwash perceptions and green trust provide insights for understanding the psychological mechanisms behind consumers' green behavior in the context of new media interaction.

In terms of differences, foreign research started earlier and is more in-depth and detailed in the expansion of theoretical models and the study of the role of social media and opinion leaders. They continue to improve the theoretical framework and introduce new variables and relationships to more accurately explain consumer behavior. Domestic research is closely combined with local new media operation platforms, such as WeChat, Douyin, etc., as well as consumer group characteristics for analysis, focusing on Highlight the synergy between new media and corporate green marketing, and explore how to use the advantages of local platforms to promote green consumption.

Overall, there are still some shortcomings in current research. There are few studies on the long-term impact of dynamic changes in new media operating models on consumers' green consumption intentions, which fail to fully capture the continuous evolution of consumer behavior during the rapid development of new media. Research on the comprehensive mechanism of different new media platforms also needs to be strengthened, and there is no systematic disclosure of the interactive effects between platforms and how to integrate platform resources to improve green marketing effects. In addition, existing research is generally based on cross-sectional data, which makes it difficult to form robust causal inferences. Hayes[5] also rarely verifies the universality and cultural regulation of variables such as identity from a cross-cultural perspective. These shortcomings point out the direction for subsequent research, which needs further in-depth exploration.

2. Model building and solving

2.1. Study design and data processing

First, the questionnaire design and variable measurement, all scales use the Likert 5-point scale, 1 to 5 represent strongly disagree to strongly agree, green value perception, including 4 questions such as "I think the product meets environmental protection requirements", consumer trust mechanism, including 4 questions, such as "I think the environmental attributes of the product are

credible", environmental identity, including 3 questions, such as "I think I am an environmentally friendly person", green consumption intention, including 4 questions, such as "I will give priority to environmentally friendly products", etc., quantified as Q1-Q15. The control variables are age, gender, education, city level, and whether there is green consumption experience.

Secondly, the data source and survey method of this article are as follows: consumers aged 18 and above who have experience with green products or use social media are the main survey subjects, and data is collected anonymously through social media (such as WeChat, QQ, Xiaohongshu, Douban, Zhihu, etc.). The sample covers information such as gender, age, education, and frequency of new media use, and is representative. A total of 458 questionnaires were issued, and 418 valid questionnaires were collected, with an efficiency rate of 91.3%.

A descriptive analysis of the questionnaire is shown in Figure 1 below.

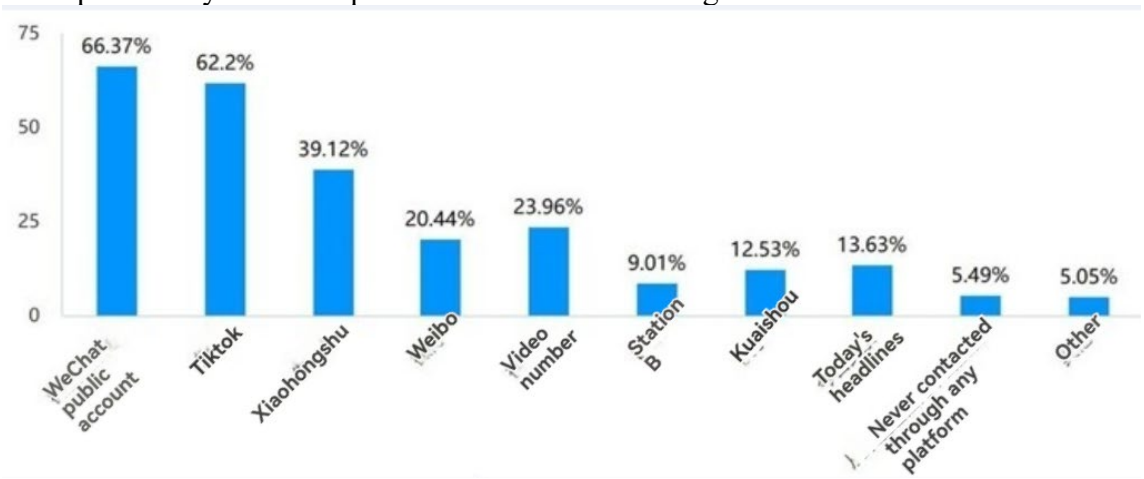

Figure 1 Statistics of new media communication channels

Table 1 Descriptive statistics of respondents

Demographic variables	Category	Frequency	Percent
Gender	Male	139	33.3%
	Female	279	66.7%
Age	<20	40	9.6%
	21-30	97	23.2%
	31-40	159	38.0%
	41-50	93	22.2%
	>50	29	6.9%
Education	High school or below	120	28.7%
	Bachelor's degree	148	35.4%
	Graduate students and below	140	33.5%
Development level of the city	Postgraduate and below	10	2.4%
	First-tier cities	36	8.6%
	Second-tier cities	93	22.2%
	Third-tier cities	270	64.6%
	Other	19	4.5%

The above figure reflects the statistics of new media communication channels. The results show that most netizens are mainly exposed to organic fruit and vegetable green promotion through mainstream domestic social media such as WeChat public accounts, Douyin and Xiaohongshu. The descriptive statistics of the respondents are shown in Table 1 below.

From the perspective of gender distribution, regarding the report on consumers' willingness to consume organic fruit and vegetable green under the new media operation model, men accounted for 33.3% and women accounted for 66.7%, indicating that women have a high degree of participation in green consumption. From the perspective of age distribution, the age of the survey subjects is mainly concentrated in the 31-40 years old, accounting for 38.0%. Secondly, the

distribution of the call subjects aged 21-30 and 41-50 is relatively even, accounting for 23.2% and 22.2% respectively. There are fewer survey subjects under 20 and over 50, accounting for 9.6% and 6.9% of the total, respectively. From the perspective of educational background distribution, the majority of samples are undergraduates and junior college students, accounting for 33.5% and 35.4%, followed by high school and below education, accounting for 28.7%, and graduate and above education, accounting for 2.4%. Overall, the survey subjects have a medium level of education. In terms of urban distribution, third-tier cities account for a high proportion, up to 64.4%, followed by second-tier cities at 22.2%, first-tier cities at 8.6%, and other cities at 4.5%, indicating that residents in third-tier cities have a high degree of participation. According to the report results, 84.0% of the surveyed subjects have green consumption experience. Overall, residents have a high degree of participation in green consumption.

The reliability analysis of the questionnaire is shown in Table 2. The Cronbach's α values of the four variables of green value perception, consumer trust mechanism, environmental identity, and green consumption willingness are 0.922, 0.936, 0.956, and 0.951, respectively, and the total Cronbach's α value is 0.978, all greater than 0.7, indicating that the scale has good internal consistency and is very reliable.

Table 2 Reliability Analysis

	Cronbach's coefficient	Number of items
Dependent variable	0.951	4
Mediating variable	0.936	4
Moderator variable	0.956	3
Independent variable	0.922	4
Overall	0.978	15

The KMO test coefficient value is close to 1, indicating that the questionnaire has good validity. According to the significance of the sphericity test, it can also be seen that the significance of this test is infinitely close to 0. Reject the original hypothesis. Therefore, the questionnaire has good validity, as shown in Table 3 below.

Table 3 KMO and Bartlett's test

KMO sampling suitability measure		.964
Bartlett sphericity	Approximate Chi-Square Test	8456.956
	Degrees of Freedom	105
	Significance	.000

The correlation between the variables was analyzed by Pearon correlation analysis. At the 0.01 level (two-tailed), the correlation was significant. The results showed that the correlation between V1 and Q1-Q15 was generally very weak and insignificant. The only significant one was the negative correlation between V1 and Q4 ($r = -0.108$, $p = 0.027$), but it was also very weak. Q1-Q15 had good internal consistency, so it was speculated that they reflected the possible influence of one or several potential factors, which met the prerequisites of factor analysis. Combined with the previous KMO and Bartlett tests, it was shown that questionnaire Q1-Q15 was likely to be a mixed scale of multiple dimensions, so the data was very suitable for subsequent factor analysis.

2.2. Research on the mediating effect of trust mechanism based on PROCESS Model 4

Mediating effect analysis Whether green value perception affects green consumption willingness through consumer trust, the three-step regression analysis method proposed by Baron and Kenny is used to test the mediating effect.

First, green value perception is used as a precondition variable and is regressed with green consumption willingness. The first step results show that when the precondition variable is used as a separate variable to predict green consumption willingness, the regression coefficient is 0.820, F significance is less than 0.001, $t=29.212$, $p<0.001$, $R^2=0.671$, which can explain 67.1% of the total change in green consumption willingness, indicating that green value perception has a significant

effect on green consumption willingness, verifying hypothesis H2. Then the impact of green value perception on consumer trust will be studied. The second step results show that F significance is less than 0.001, β=0.814, t=28.568, p<0.001, 2=0.662, which can explain 66.2% of the total change in consumer trust, indicating that green value perception has a significant effect on consumer trust, verifying hypothesis H1. Finally, we combined green value perception and consumer trust to study their impact on green consumption willingness. The results of the third step showed that F was less than 0.001, GV: β=0.434, t=10.233, p<0.001, R^2=0.747, which can explain 74.7% of the total change in green consumption willingness, TR: β=0.475, t=11.1195. Compared with regression 1, after adding the mediator TR, the impact of green value perception on green consumption willingness decreased from 0.820 to 0.434, which was a significant change, indicating the existence of a mediation effect, verifying hypotheses H3 and H4, and it was a partial mediation effect. The results of the mediation effect analysis are shown in Table 4 below.

Table 4 Results of mediation effect analysis

	Regression 1	Regression 2	Regression 3
Variables	Green value perception	Consumer trust	Green consumption intention
B	0.810	0.865	0.428/0.441
Beta	0.820	0.814	0.434/0.475
t	29.212	28.568	10.233/11.195
t Significance	<0.001	<0.001	<0.001
R	0.820	0.814	0.865
R Significance	0.672	0.662	0.748
Error in standard estimate	0.45886	0.50137	0.40262
Adjusted	0.671	0.662	0.747
F	853.358	816.145	616.867
F Significance	<0.001	<0.001	<0.001

In order to further verify the mediation effect, the stepwise regression mediation effect test proposed by Baron and Kenny was used here to set the Bootstrap sampling to 5000 times and the confidence level CI to 90%. If the bias-corrected confidence interval of the indirect effect does not include 0, it indicates that there is a mediation effect. The results show that the effect of green value perception on consumer trust: $p < 0.001$, the upper and lower bounds do not include 0, the effect of green value perception + consumer trust on green consumption intention: $p < 0.001$, the upper and lower bounds do not include 0. The total effect value is 0.8099, P<0.001, the upper and lower bounds are [0.7554, 0.8644], $R^2 = 0.672$: GV explains 67.2% of PI, and the total effect is significant, the direct effect value is 0.4284, P<0.001, the upper and lower bounds are [0.3461, 0.5107], $R^2 = 0.662$: Green value perception explains 66.2% of consumer trust, and the direct effect is significant, the indirect effect value is 0.3862, P<0.001, the upper and lower bounds are [0.2351, 0.5317], $R^2 = 0.748$: Green value perception and consumer trust jointly explain 74.8% of green consumption intention, and the indirect effect is significant, after introducing the trust mechanism as a mediating variable, the direct effect is reduced to 0.4284 (p<0.001), and the mediating path effect is 0.3862. The Bootstrap 90% confidence interval is [0.2351, 0.5317], which does not include 0, indicating that the mediation effect is significant. Since the direct effect is also significant, it is a partial mediation effect, and the mediation effect accounts for 0.3862/0.8099× 100% ≈47.7%. The results of the mediation effect test are shown in Table 5.

Table 5 Mediation effect test

Effect name	Effect value (regression coefficient)	SE	Lower	Bootstrap 90% Upper	CI p
Total effect	0.8099	0.0277	0.7554	0.8644	<0.001
Direct effect	0.4284	0.0419	0.3461	0.5107	<0.001
Indirect effect	0.3862	0.0792	0.2351	0.5317	CI does not contain 0

2.3. A study on the moderating effect of environmental identity based on PROCESS Model 7

The moderating effect tests whether environmental identity regulates the process in which green value perception affects consumer trust. Existing studies have shown that individuals with high identity are more sensitive to environmental stimuli and are more easily influenced by the information conveyed by the environment. In this process, the environmental protection concept conveyed by green value perception is more likely to stimulate individuals' sense of responsibility and generate environmental identity resonance. The results of the moderating effect interaction model 1 and 2 are shown in Table 6 below, and the significant results of the moderating effect model 1 and 2 are shown in Table 7 below.

Table 6 Regulation effect interaction term model 1 and 2

Model	Constant	Standardized Coefficient	t	Significance
1	Green value perception	0.434	10.233	<0.001
	Consumer trust	0.475	11.195	<0.001
2	Green value perception	-0.274	-5.268	<0.001
	Consumer trust	0.185	5.104	<0.001
	GVEI	1.012	17.372	<0.001

Table 7 Significance of Moderation Effect Models 1 and 2

Model	2	Standard Estimate	F	Significance
1	0.748	0.40262	616.867	<0.001
2	0.854	0.30657	809.914	<0.001

Table 7 above shows that after adding the interaction term between green value perception and environmental identity, the explanatory power of the model is significantly improved.

When the average EI Likert score is higher than 3.16, green value perception has a significant impact on consumer trust, and the moderating effect is established, as shown in the slope graph in Figure 2 below.

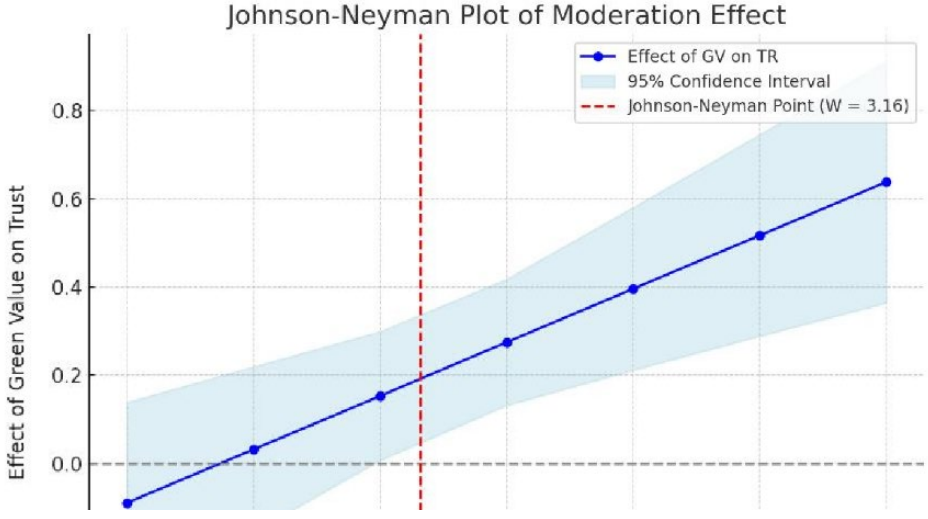

Figure 2 Moderator Effect Slope Plot

The horizontal axis is the moderating variable environmental identity (W), and the vertical axis is the effect of the independent variable green value perception (GV) on the dependent variable green consumption willingness (TR). The shaded part indicates that the effect is not significant at the 0.05 significance level. The solid line is the effect estimate, and the dotted line is its 95% confidence interval. The figure shows that when W > 3.16, the effect of green value perception on consumer trust is significant.

The hypothesis verification results of the model are shown in Table 8 below.

Table 8 Model hypothesis verification results (N=418)

Research hypothesis	Standardized path coefficient	Significance	Conclusion
H1: Green value perception → consumer trust	0.814	<0.001	support
H2: Green value perception→ green consumption intention	0.820	<0.001	support
H3: Consumer trust→ green consumption intention	0.434	<0.001	support
H4: Consumer trust plays a mediating role	0.434	<0.001	support
H5: Environmental identity plays a moderating role	1.012	<0.001	support

3. Conclusion

This study reveals that consumers have a significant willingness to consume green organic fruits and vegetables in the new media environment, and systematically analyzes the formation mechanism and transformation path of consumers' green consumption behavior. Their decision-making is driven by both the platform trust mechanism and the communication of environmental protection values. Enterprises can effectively enhance consumer trust through digital strategies such as production visualization and traceability interaction, but there are common problems in the market such as green cognitive faults and lack of information supervision. The study found that consumers' willingness to pay a premium for green organic fruits and vegetables presents a three-order evolutionary feature of "cognitive drive-emotional identification-behavioral transformation". New media platforms have significantly enhanced the perceived credibility and emotional resonance of green products through digital means such as visual narrative, social communication and scenario interaction. Among them, the "transparent brand window" of WeChat official accounts and the "green efficiency visualization comparison experiment" of Douyin live broadcast have been confirmed to be the most effective communication paradigms, which can increase consumers' willingness to pay by 23%-35%.

In theory, the innovative integration of media environment variables expands the research framework of consumer behavior, in practice, it proposes to build a green consumption ecological system of "government, enterprise, academia and media" collaboration, and recommends breaking the "cognition-behavior" transformation barrier through standardized certification, dynamic communication and precise supervision. The research is limited by cross-sectional data and model simplification. In the future, it is necessary to combine experimental methods with big data to deepen the research on price sensitivity and competitive product substitution effect, and provide more systematic decision-making support for sustainable development.

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