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## Purchase Intention and Behavior of Young Consumers for Live-streaming Fresh Agricultural Products: Deviation Identification and Influencing Factors

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## Abstract

The "live-streaming + agricultural products" mode, which is detonated by mobile Internet technology and digital economy, is regarded as a new opportunity for rural revitalization and poverty alleviation in the rural e-commerce model. The contribution of live broadcast of goods in solving the docking of agricultural product production and marketing, increasing farmers' income, promoting rural revitalization and consolidating poverty alleviation was so great that it could not be ignored. As the core group of live-streaming shopping, young consumers' consumption behavior determines the long-term marketing effect of live-streaming. Most of the existing studies take consumers' purchase intention as the dependent variable. However, in reality, there is often a certain deviation between consumers' declarative intention and actual purchase behavior. Analyzing the reasons for the deviation is very important to promote the transformation from consumers' purchase intention to behavior of live-streaming fresh agricultural products. This research selected young consumers in Nanchang city as the survey object, randomly selected 5 counties or districts in Nanchang, conducted a questionnaire survey on 100 young consumers in each county or district, and recovered 359 valid questionnaires. Based on the valid survey data of 359 young consumers in Nanchang city, this study constructs a multivariate Logistic model to analyze the influencing factors of young consumers' live-streaming fresh agricultural products purchase intention and behavior and the deviation between them. The research shows that: (1) There is a certain deviation between the purchase intention and behavior of young consumers and their sub-groups, which is shown as "high intention, low behavior", and the deviation is significantly different among groups in education level, marital status and personal monthly consumption level; (2) Taking the positive consistency group as the reference, the deviation is mainly affected by education level, marital status, trust level, perceived convenience, perceived risk, evaluation and sales attention and attention of Internet celebrities. (3) Among the significant factors, marital status, understanding of the live-streaming fresh agricultural products, trust level of online live platform, perceived convenience, perceived risk, and attention of Internet celebrities will promote the positive consistency. Only evaluation and sales attention will inhibit positive consistency. According to the above results, corresponding marketing suggestions are put forward to promote the payment behavior of live-streaming fresh agricultural products among young consumers: (1) Merchants should actively change their marketing ideas and apply precision marketing, focusing on improving the purchase conversion rate of highly educated and married young consumers; (2) Enhance consumers' cognition and trust of live-streaming fresh agricultural products and build consumers'



confidence; (3) Pay attention to improving consumers' live-streaming fresh produce purchase experience; (4) Strengthen quality to build trust in after-sales guarantee; (4) Attach great importance to the reputation of live-streaming fresh agricultural products; (5) The influence of Internet celebrities as opinion leaders in the marketing of live stream should not be ignored. Maintain good relationship between celebrities and consumer groups.

**Keywords:** live-streaming shopping; purchase intention; payment behavior; deviation; fresh agricultural products



## Introduction

In recent years, the “live-streaming + agricultural products” mode, which is detonated by mobile Internet technology and digital economy, is regarded as a new opportunity for rural revitalization and poverty alleviation in the rural e-commerce model (Lu, 2021; Li and Zhao, 2020). According to the 46th “Statistical Report on the Development of the Internet in China”, the number of the country’s live streaming users reached 562 million by the end of June, 2020, accounting for 59.8% of the total netizens; 309 million of whom are engaged with e-commerce live streaming, accounting for 32.9% of the total netizens. Furthermore, the transaction volume of live delivery in 2019 reached more than 66.37 billion dollars. In early 2020, shocked by the novel coronavirus pneumonia, By taking advantage of social influencer marketing, the contribution of live broadcast of goods in solving the docking of agricultural product production and marketing, increasing farmers’ income and promoting rural revitalization was so great that it could not be ignored (Fu, 2021). Fresh agricultural products have the characteristics of high frequency and rigid demand (Xiao, 2020). With such a huge consumption volume, the market increment of live-streaming of fresh agricultural products will show a significant growth in the future (Zhong, 2020).

With the development of the new business of live stream, the theoretical exploration is constantly enriched, which mainly focus on the following aspects: the first is to explain the essence and connotation (Cheng, Wang and Sun, 2021), driving factors (Shen, 2020), growth logic (Zhou and Fan, 2021; Jin, 2020) and development path (Deng, 2020; Guo and Qu, 2020) of live streaming economy; The second is to reveal the potential risks of promoting goods sales through lives streaming and how to regulate and supervise it (Mei and Hou, 2021; Su, 2021); The third is to analyze consumers’ live-streaming shopping intentions, and to explore the factors influencing purchase decision and its internal mechanism (Liu and Shi, 2020; Zhou, Tang, Xiao, 2021). Whether the live streaming can play a long-term and sustainable marketing effect depends on the occurrence and persistence of consumers’ actual purchase behavior. However, there is no consensus on the commercial conversion rate or cash flow rate of live-streaming consumers. Some scholars believe that the conversion rate of e-commerce live streaming catalyzed by the traffic dividend is at a high level (Zhong, 2020; Cheng, Wang and Sun, 2021). Young consumers, especially the post-90s generation and post-00s generation, are regarded as the core consumer groups for online live streaming shopping. In February 2020, the China Consumer Association conducted a survey on consumers from 12 livestreaming platforms and found that the post-00s and post-90s are the main force of online live shopping, accounting for 59.1%. Taking Taobao live app as an example, the user portrait of Taobao live



app released by iiMedia Research showed that users under the age of 35 accounted for about 77.8% by April 2020. According to the special research report on the development of China's online live streaming industry in the first half of 2021 released by iiMedia Research, in the first half of 2021, about 24.1% of livestreaming users said they would watch the livestreaming of agricultural products. iiMedia data center also showed that in 2019, fresh agricultural products accounted for 27.01% of the commodity categories purchased by consumers in livestreaming. Young consumers' desire for live-streaming shopping is easily induced by Internet celebrity anchors and produces impulsive consumption ( Liu, Zhao, Long, 2020; Gong et al, 2019). Contrary to this, Xu et al. (2020) found that the commercial conversion rate in live clothing marketing was not high (Xu, Qu, Cai, 2020). The conversion of fresh agricultural products through live streaming rate has no relevant research results yet. So, what is the willingness of young consumers to buy fresh produce live on the web? Is there a deviation between consumption intention and actual payment behavior? What are the reasons for the deviation? Although some scholars have revealed the willingness and behavior mechanism of live-streaming consumption, previous studies regarded willingness as a predictor of behavior, ignoring the possibility of deviation between consumers' purchase willingness and behavior, that is, the situation of "willing to buy but not to buy" or "unwilling to buy but to buy". In the case of "willing to buy but not to buy", willingness as a predictor of behavior will be invalid and overestimated; while "unwilling to buy but to buy" is usually caused by external factors, so it is not sustainable. Therefore, understanding the deviation between consumers' purchase intention and behavior, and promoting the transformation of willingness to behavior, is of practical importance for promoting the long-term effect of live broadcast on fresh agricultural products consumption. To this end, focusing on intention and behavior deviation, this study breaks through the limitation that the research focusing on purchase intention can not reflect the real consumption situation, and expands the research perspective of livestreaming consumption; On the other hand, in response to the new challenges in live-streaming marketing, the business practice focusing only on improving purchase intention may not achieve the goal of increasing sales. This study investigated the young consumers in Nanchang, and took the relationship between intention and behavior of purchasing live-streaming fresh agricultural products as the outcome variable. Qualitative analysis of the degree of deviation between purchase intention and behavior of consumer subgroups. At the same time, taking "willing to buy and and paid for it" as the reference group, focus on the group of "willingness to buy but not to buy", clarify the reasons for the deviation of consumers' purchase intention and behavior in live-streaming fresh agricultural products,

weaken the deviation between intention and behavior, and promote the transformation of purchase intention into behavior.

### Literature review

The theory of planned behavior (TPB) holds that the generation of individual behavior intention is affected by attitude, subjective norm and perceived behavior control, and intention is an important pre variable of behavior, which will directly determine the occurrence and intensity of individual behavior (Ajzen, 1991). Research results in the field of behavior show that individual decision-making is not completely rational, and intention does not always accurately and effectively predict behavior, and there is a deviation between them (Ajzen, 2020). Intention is not a sufficient and necessary condition for behavior. Researchers believe that the deviation between intention and behavior is caused by a series of continuous links. First of all, attitude and subjective norm reflect the rational process of consumer analysis, choice, and judgment. They affect individual behavior by influencing individual intention, and are considered to be the primary condition for influencing the transformation of intention to behavior (Zhang et al, 2015). For example, the degree of cognition will significantly affects the deviation between consumption intention and behavior, and low cognition will lead to a higher degree of deviation between intention and behavior (Wang, Tao, Chen, 2019). Wang and Gao (2020) confirmed that subjective norms, including sales recommendations, relatives and friends, other consumers, government propaganda, and media information, would affect whether consumers' purchase intentions and behaviors are inconsistent. Furthermore, consumers' pursuit of the goal of "maximizing utility" is the prerequisite for the implementation of purchase behavior. Once the intention conflicts with the goal of "maximizing utility", it will lead to deviations between intention and behavior (Yu et al, 2017). For instance, the survey conducted by Park and Lin (2020) found that many consumers who expressed positive purchase intentions did not make purchase behaviors. They examined perceived value, risk, perceived consumer efficacy, subjective norms, and demographics variables and other factors had different effects on purchase intention and behavior. In addition, consumer psychological experience factors can also affect the gap between intention and behavior. Studies have confirmed that the perceived communication, satisfaction and trust of consumers positively and significantly improve purchase behavior and weaken the deviation between purchase intention and behavior (Sultan, Tarafder, and Henryks, 2019).

Many scholars have conducted qualitative analysis and empirical tests on the antecedents of consumption intentions and behaviors of live-streaming shopping, focusing on individuals,



Internet celebrities, live broadcast processes, and psychological and emotional factors. Consumer groups in live streaming have great homogeneity, which weakens the influence of individual characteristics (Liu and Shi, 2020). As a key opinion leader, online celebrities played an important role (Chen, 2020). The recognition and trust of live broadcast consumers promoted the transaction and realization (Xu, Wu, Li, 2020). The comprehensive personalized services provided by Internet celebrities in live-streaming marketing, such as product after-sales service and logistics services, will also promote consumers to purchase (Yan et al, 2021) Some scholars have used the grounded theory to analyze the formation mechanism of consumers' online live broadcast purchase intention from the three categories of consumer cognition, emotion and intention (Liu, Zhao, Long, 2020). Through the structural equation model, it was verified that the unique characteristics of professionalism, interactivity and entertainment played an important role in inducing consumer behavior (Geng et al, 2020; Liu et al, 2020; Meng et al, 2020). And the induction was mediated by pleasure, arousal and trust (Liu, Li, Yin, 2020; Chen, Gao, Wen, 2020; Fan et al, 2020).

The academic discussion on individual intention and behavior deviation was very common, which were reflected in various fields. In food consumption (Wu, Xia and Luo, 2019; Chen et al, 2013; Wang, Yang, Zhu, 2018), green consumption (Zhang and Li, 2017; Qi et al, 2019; El haffar, Durif, Dube, 2020; Nguyen, Nguyen, Hoang, 2018), ethical consumption (Wang, Lei, Wu, 2017; Rausch & Kopplin, 2021), environmental protection (Khan et al, 2020) and technology adoption (Li & Chen, 2020; Li & Yin, 2021; Wang & Liu, 2021) and other fields, researchers have confirmed that there is a deviation between stated intentions and actual behavior. Following the gap between intention and behavior, through a series of empirical studies, scholars found that the deviation could be attributed to various factors. Some scholars believe that demographic variables (such as gender, education level, etc.), cognitive level and trust level will affect the degree of intention and behavioral deviation. For example, male tourists showed a higher degree of deviation between their environmental responsibility willingness and behavior than female tourists, and the higher their level of education, the less likely they are to deviate from their environmental responsibility willingness and behavior (Duan et al, 2021). Research on green production and consumption confirmed that low cognitive level and distrust would lead to deviations of intention and behavior (Luo, Li, Xu, 2020; Nuttavuthisit & Thogersen, 2015). Other scholars found that the reasons for the differences between consumer' stated intentions and actual consumption behavior lie in the uncertainty of consumer's preference, consumer's characteristics, environmental factors and risk perception. The research of Li and Mattsson





(1995) showed that due to the uncertainty of preference, there was often a large gap between the stated purchase intentions and actual consumption behavior. Deng (2014) demonstrated that the key influencing factors of ethical consumers' inconsistency between words and deeds are not only determined by consumer characteristics, such as moral maturity, purchase inertia and ethical consumption cognitive efforts, but also depend on situational factors (Guagnano, Stern & Dietz, 1995). Only when consumers do not increase the additional cost of consumption (such as information identification of ethical products, inconvenience of shopping, etc.), consumers with purchase intention would make real purchase. Even the current mood or state of consumers when making purchase decisions will lead to deviation between the intention and behavior. Wang, Geng and Xiao (2020) also believed that the transformation from intention to behavior requires the activation and regulation of personal characteristics and situational factors. According to the research on consumers' online shopping intention and behavior, the information asymmetry associated with the Internet virtual environment increased (Utz, Kerkhof, van den Bos, 2012), and consumers at an information disadvantage faced more opportunistic threats and transaction uncertainty (Wang, Cai, Ning, 2020). It makes consumers perceived higher risks than traditional shopping methods, which hindered the actual purchase (Li, 2014). Thus, both internal and external complex factors will lead to the inconsistency between consumers' purchase intention and their actual payment behavior. The prediction of pure willingness survey data is inaccurate and can not accurately replace consumers' actual behavior.

To sum up, although the existing research results have carried out researches on individual intention, behaviors and the relationships between them from the perspectives of psychology, economics, management and behavioral theories, there are few empirical studies on the consumption of live agricultural products at the consumer level. Throughout the existing studies, the purchase intention of live-streaming fresh agricultural products was often regarded as a predictive variable of purchase behavior. However, previous studies have confirmed that there was a deviation between the willingness and behavior in reality, which led to the prediction of willingness on behavior was not always accurate and effective, thus the product production and investment decisions based on purchase intention are likely to pay a high price of failure. Therefore, it is necessary to take the intention and behavior deviation into the scope of investigation to better guide the marketing practice. This study intends to solve the following problems: firstly, using descriptive statistical methods to identify the degree of deviation between consumers' live-streaming fresh agricultural products purchase intention and behavior; On the basis of qualitative analysis, this paper empirically analyzes

the deviation of consumers' purchase intention and behavior, reveals the factors influencing the deviation between purchase intention and behavior of live-streaming fresh agricultural products, and puts forward relevant marketing suggestions. The possible contribution of this study is as follows: live streaming as a new consumption format, although there has been some research on the purchase intention of live-streaming products, few researchers try to connect the purchase intention with the actual purchase behavior, and the deviation between purchase intention and behavior of live-streaming fresh agricultural products is ignored. This study brings intention and behavior into a unified analysis framework, and introduces the perspective of inconsistency between purchase intention and behavior to identify the deviation between the consumption intention and behavior of live-streaming fresh agricultural products. Given the complexity and uncertainty in the process of putting purchase intention into actual behavior, this study selects the independent variables causing intention and behavior deviation, pays attention to the inconsistency between intention and behavior caused by consumers' psychological perception experience in the process of live-streaming shopping, and takes into account factors such as individual characteristics, cognitive attitude, demand fit and subjective norms. This study expands the application scope of planned behavior theory and enriches the literature research on consumption decision-making, intention and behavior deviation of live-streaming products. At the same time, the market potential and economic benefits of live streaming format largely depend on consumers as the final demander. The research on the deviation between their purchase intention and payment behavior is helpful to identify and reveal the causes of the deviation, so as to optimize the marketing strategy and promote the effective conversion of consumers' purchase intention of live-streaming fresh agricultural products into real payment behavior.

## Data

In this study, questionnaire survey was used to collect data. The content of the questionnaire included each respondent's individual characteristic information (such as gender, marital status, educational level, personal monthly expenditure), cognitive attitude towards live-streaming fresh agricultural products (including cognition and trust), live streaming experience perception, purchase intention and purchase behavior, etc. China national bureau of statistics defined the age range of the youth group as 15-34 years old. The research object of this study is young consumers with certain purchasing power, Therefore, we selected young consumers aged 18-34 as the survey objects. Before the formal survey, 50 young consumers in Nanchang were randomly pre surveyed to further modify and improve the content of the questionnaire to ensure the effectiveness of the survey. The formal survey was



conducted in Nanchang from June to October 2019, and samples were selected by random sampling method. Firstly, five districts of Nanchang were randomly selected, including Qingshanhu District, Donghu District, Xihu District, Qingyunpu District and Xinjian district. The respondents were randomly intercepted and investigated in crowded places such as shopping malls, subway entrances and schools in the five districts. A total of 500 questionnaires were distributed to young citizens and 425 were actually returned. After eliminating incomplete filling, logical inconsistency and a few questionnaires in case of “unwilling to buy but to buy”, 359 valid questionnaires were obtained, with an effective rate of 84.5%. Consumers were divided according to gender, educational level, marital status, and personal monthly expenditure. The specific sample characteristics were shown in Table 1.

Table 1 Basic characteristics of the sample (N=359)

Variable	Variable Interpretation	Proportion (%)	Proportion of consumers willing to buy (%)	Proportion of consumers have purchased(%)
Gender	Male	42.9	57.1	37.0
	Female	57.1	57.5	38.0
Education Level	High school or below	8.9	68.8	59.4
	College or undergraduate	75.5	54.2	33.2
	Bachelor degree or above	15.6	66.0	46.4
Marital Status	Unmarried	84.4	53.5	31.4
	Married	15.6	78.5	71.4
Personal monthly expenditure	314 dollars or below	53.2	45.0	27.2
	314 to 628 dollars	29.5	72.6	43.4
	628 dollars or above	17.3	69.4	59.7
All Sample		100	57.4	37.6

Consumers generally have strong intention to buy live-streaming fresh agricultural products, and consumers with purchase intention account for 57.4% of the total. Among them, the number of male and female consumers with purchase intention is almost the same. However, there are differences in purchase intention among consumers with different educational levels, different marital status and personal monthly expenditure. Consumers with high school and below, married and personal monthly expenditure of 314 to 628 dollars are more willing to buy. Although consumers express their willingness to buy, the purchase



intention expressed by consumers has not been fully transformed into behavior. Only 37.6% of consumers said they have purchased live-streaming fresh agricultural products. Among them, female, high school and below, married and personal monthly expenditure of more than 628 dollars consumers have a greater proportion of actual purchase behavior.

This paper takes the positive answer of consumers “whether you are willing to buy online live fresh agricultural products” as the standard of consumer’ purchasing intention, “whether they have paid for live-streaming fresh agricultural product” as the standard of purchasing behavior. Based on this, the relationship variable of willingness and behavior is constructed. We defined the case of “willing to buy and paid for it” as a “positive consistency”, the case of “willing to buy but not to buy” as a “deviation”, and the case of “unwilling to buy and not to buy” as a “negative consistency”.

Table 2 describes the consistency of consumers’ purchase intention and behavior (including positive consistency and negative consistency) and the paradox (willing to buy but not to buy). It is found that the probability of deviation between consumers’ overall purchase intention and actual behavior is 19.8%. Chi square test was conducted on the positive and negative consistency and deviation of different consumer subgroups. It was found that the proportion of positive consistency of married consumer subgroups was higher than that of unmarried subgroups, and there was significant difference between married and unmarried groups. The higher the personal monthly expenditure, the positive consistency proportion increased significantly, and there were significant differences among groups with different personal monthly expenditure. Divided by educational level, the lowest proportion of people with positive consistency is the group with college or undergraduate education, and there are significant differences among groups with different educational level. It shows that there is a deviation between the purchase intention and actual behavior of consumers and their subgroups. The possible explanation is that consumers are easy to take strategic behavior and overestimate their purchase intention when they state their intention. However, when they really make a purchase decision, they are vulnerable to situational factors, psychological factors and other reference subjects, making the purchase behavior more uncertain. Therefore, the prediction of intention to behavior is not completely reliable.



Table 2 Deviation description of consumers and their subgroups' purchase intention and behavior for live-streaming fresh agricultural products

Criteria for the classification	Subgroups	Proportion (%)			Mean	Chi square test
		Positive consistency	Deviation	Negative consistency		
Gender	Male	37.0	20.1	42.9	1.06	0.046
	Female	38.0	19.5	42.4	1.04	
Education level	High school and below	59.4	9.4	31.3	0.72	11.141**
	College or undergraduate	33.2	21.0	45.8	1.13	
	Bachelor degree or above	46.4	19.6	33.9	0.88	
Marital status	Unmarried	31.4	22.1	46.5	1.15	32.532***
	Married	71.4	7.1	21.4	0.50	
Personal monthly expenditure	314 dollars or below	27.2	17.8	55.0	1.28	37.549***
	314 to 628 dollars	43.4	29.2	27.4	0.84	
	628 dollars or above	59.7	9.7	30.6	0.71	
All Sample		37.6	19.8	42.6	1.05	

Based on the existing studies, this paper selects 15 explanatory variables, which can be divided into six categories. Related items are all taken on the Likert five-level scale, 1-5 means from strongly disagree to strongly agree. The specific explanatory variables are as follows : first, consumer individual characteristics, including gender, education level, marital status and personal monthly expenditure. Second, consumers' cognitive attitude towards live online fresh agricultural products includes two variables(Wang, Tao, Chen, 2019; Huang & Lu, 2017): the cognition of live online fresh agricultural products and the degree of trust in the purchase of live online platform. The third is consumers' experience perception of buying live-streaming fresh agricultural products(Zhang, Zhang, Zhao, 2021), including 4 variables: perceived entertainment, perceived interactivity, perceived purchase efficiency and perceived convenience. The four variables are respectively correspond to the question items "You can buy fresh agricultural products while entertaining in the live stream", "You can share and exchange relevant information with others during the live stream", and "It is more efficient to buy fresh agricultural products in the live stream" and "It is convenient to buy fresh



agricultural products in the live stream”, the larger the value, the stronger the perception. The fourth is the demand fit(Cao, Dai, Zhao, 2012), including service fit and product-information fit, corresponds to the topics “I think the live stream can provide the services I need” and “I think the information provided by the live stream is sufficient to meet my needs for purchasing fresh agricultural products”, the larger the value, the higher the degree of demand fit. The fifth is the perceived risk(Li & Chen, 2020), answer the question “I think there is no guarantee for the quality of fresh agricultural products purchased through live streaming”, the larger the value, the higher the perceived risk. The sixth is subjective norms(Wu, Xia, Luo, 2019; Wang & Gao, 2020), including two variables: evaluation and sales attention and the attention of Internet celebrities, corresponding to the item “I will pay attention to the evaluation and sales before buying” and “I will buy fresh agricultural products recommended by internet celebrities”, the large value means that consumers pay more attention to evaluation from other consumers, sales volume and recommendation of Internet celebrities. That is, the larger the value, the higher the influence of these variables.

Table 3 Variable description

	Variable	Variable interpretation	Mean	Std.
Dependent variable	Purchase intention	No=0, Yes=1	0.57	0.495
	Purchase or not	No=0, Yes=1	0.38	0.485
	The relationship between intention and behavior	Positive consistency=0, Deviation=1, Negative consistency =2	1.05	0.896
Independent variable				
Individual characteristics	Gender	Female=0, Male=1	0.43	0.496
	Education level	1-3	2.07	0.491
	Marital status	Unmarried=0, Married=1	0.16	0.363
Cognition and attitude	Personal monthly expenditure	1-3	1.64	0.760
	Cognition	1-5	2.52	1.235
live streaming experience perception	Trust level	1-5	2.82	1.197
	Entrainment	1-5	3.31	1.187
	Interactivity	1-5	3.26	1.230
Demand fit	Purchase efficiency	1-5	3.09	1.252
	Convenience		3.26	1.207
	Service fit	1-5	3.21	1.166
Perceived risk	Information fit	1-5	3.20	1.210
	Perceived risk		3.01	1.160
Subjective norms	Evaluation and sales attention	1-5	3.97	1.185
	Attention of Internet celebrities	1-5	2.72	1.284

Use table note to describe what 1-5 mean.

Note: Strongly disagree=1, Dissagree=2, Normal=3, Agree=4, Strongly agree=5

### Model

In order to investigate the factors affecting the deviation of the purchase intention and behavior of live-streaming fresh agricultural products, the relationship of the consumers' purchase willingness and behavior of live-streaming fresh agricultural products is the dependent variable.

Based on the relationship between consumers' purchase intention and behavior, we defined the case of "willing to buy and paid for it" as a "positive consistency", the case of "willing to buy but not to buy" as a "deviation", and the case of "unwilling to buy and not to

buy” as a “negative consistency”, respectively assigned the value of “0”, “1”, “2”. Then establish a disordered Logistic model. Finally, we obtain the significant influencing factors and robust standard errors of consumers’ live-streaming fresh agricultural products deviation of purchase intention and behavior.

$$Z_i = \alpha + \beta_i X_i + \mu \quad (1)$$

In equation (1),  $\alpha$  is the intercept,  $X_i$  stands for independent variable,  $\mu$  is the error term, the probability of the deviation of consumers' purchase intention and behavior of live-streaming fresh agricultural products is as follows.

$$P_i = f(Z_i) = F(\alpha + \beta_i X_i + \mu) = \frac{1}{1 + e^{-Z_i}} = \frac{1}{1 + e^{-(\alpha + \beta_i X_i + \mu)}} \quad (2)$$

In equation (2),  $e$  is the base of the natural logarithm, and its estimated formula is as follows.

$$\ln\left(\frac{P_i}{1 - P_i}\right) = Z_i = \alpha + \sum_{i=1}^{15} \beta_i X_i + \mu \quad (3)$$

In equation (3), the event occurrence ratio is the occurrence ratio of the second type of event (deviation), the third type of event (negative consistency) to the first type of event(positive consistency).

### Estimation Restuls

Identify influencing factors of consumers’ live streaming fresh agricultural products deviation of purchase intention and behavior. Model 1 analyzes the influencing factors of the occurrence ratio of deviation to positive consistency, and Model 2 analyzes the influencing factors of the occurrence ratio of negative consistency to positive agreement. The model has a good fit and passed the statistical test at the 1% level. Table 4 reports the regression coefficients and robust standard errors of each explanatory variable. At the same time, the marginal effects of significant influencing factors are calculated to estimate the degree of their influence. The analysis results are shown in Table 5.





Table 4 Influencing factors of consumers' deviation of purchase intention and behavior for live-streaming fresh agricultural product

Item	Model 1(deviation/positive consistency)			Model 2(negative consistency/positive agreement)		
	Coefficients	Robust standard error	Relative risk ratio	Coefficients	Robust standard error	Relative risk ratio
Gender	0.425	0.404	1.530	0.909	0.654	2.481
Education level	-0.694*	0.404	0.500	-0.572	0.829	0.564
Marital status	-1.772***	0.621	0.170	-0.421	1.296	0.656
Personal monthly expenditure	-0.031	0.274	0.969	-0.898	0.593	0.407
Cognition	-0.319	0.220	0.727	-0.544*	0.298	0.581
Trust level	-0.436*	0.253	0.647	-2.188***	0.483	0.112
Entertainment	0.305	0.312	1.356	0.762*	0.405	2.142
Interactivity	-0.148	0.228	0.862	0.313	0.339	1.367
Purchase efficiency	-0.192	0.302	0.825	-1.941***	0.541	0.144
Convenience	-1.014**	0.499	0.363	-0.846	0.730	0.429
Service fit	-0.107	0.439	0.898	-2.342***	0.780	0.096
Information fit	-0.271	0.314	0.763	-0.418	0.372	0.658
Perceived risk	-0.576**	0.252	0.562	0.173	0.429	1.189
Evaluation and sales attention	0.907***	0.317	2.478	0.229	0.438	1.257
Attention of Internet celebrities	-0.494**	0.194	0.610	-1.649***	0.335	0.192
Constant	8.184	2.305		27.067	5.070	
Log pseudo-likelihood	-141.760					
Prob>chi2	0.000					
Wald chi2(32)	99.04					
Pseudo R2	0.625					

Note: \*, \*\*, \*\*\* indicate significant at the levels of 10%, 5%, and 1%, respectively.

Table 5 Marginal effect analysis of factors

Variable	Positive consistency		Deviation		Negative consistency	
	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error
Gender	-0.044	0.035	0.016	0.037	0.028	0.027
Education level	0.059	0.036	-0.055	0.038	-0.004	0.034



Marital status	0.136***	0.048	-0.173**	0.076	0.037	0.064
Personal						
monthly	0.015	0.025	0.025	0.026	-0.040*	0.023
expenditure						
Cognition	0.031*	0.018	-0.016	0.021	-0.015	0.013
Trust level	0.064***	0.019	0.023	0.021	-0.087***	0.013
Entertainment	-0.033	0.026	0.008	0.028	0.025	0.017
Interactivity	0.006	0.020	-0.025	0.019	0.019	0.012
Purchase						
efficiency	0.042*	0.025	0.041	0.027	-0.083***	0.017
Convenience	0.087**	0.042	-0.080**	0.041	-0.007	0.027
Services fit	0.042	0.038	0.063	0.042	-0.105***	0.032
Information						
fit	0.026	0.026	-0.015	0.030	-0.011	0.015
Perceived						
risk	0.040*	0.020	-0.066***	0.022	0.026	0.017
Evaluation						
and sales	-0.070***	0.025	0.088***	0.024	-0.018	0.015
attention						
Attention of						
Internet	0.060***	0.015	0.000	0.015	-0.060***	0.010
celebrities						

Note: \*, \*\*, \*\*\* indicate significant at the levels of 10%, 5%, and 1%, respectively.

In terms of individual characteristics, education level and marital status are significant in model 1, at the significance level of 10% and 1%, respectively. The marginal effect shows that compared with unmarried consumers, married consumers tend to be more consistent in their willingness and behavior to consume live-streaming fresh agricultural products, and the probability of positive consistency increases by 13.6%, and the probability of deviation is lower, and the probability of deviation is reduced by 17.3%. The possible reason is that compared with unmarried consumers, married consumers have a higher cost of time and energy for shopping. Live-streaming shopping has a certain time pressure and requires consumers to make purchase decisions quickly within a short period of time. Pressure makes it easier to make purchases.

From the perspective of cognition and attitude, in Model 2, the level of cognition of live-streaming fresh agricultural products is significant at 10%. The marginal effect shows that the probability of positive consistency between purchase intention and behavior of live-streaming fresh agricultural products increases by 3.1% for each level of understanding. The possible explanation is that the live-streaming fresh agricultural products is a new thing

that has appeared in recent years in China. The more consumers know about the live-streaming fresh agricultural products, the easier it is for them to accept the live-streaming fresh agricultural products, and the easier it is for their purchase intention to translate into actual purchase behavior. Trust level passed the significance level of 10% and 1% in Model 1 and Model 2 respectively. The marginal effect shows that for each level of trust, the probability of positive consistency will increase by 6.4%, and the probability of negative consistency will reduce by 8.7%. The possible reason is that consumers believe that they can buy the fresh agricultural products they need through the live streaming because they trust the online livestreaming platform, so they are more inclined to buy fresh agricultural products through the online livestreaming and will pay for them.

From the perspective of live streaming experience perception, in Model 2, consumers' perceived entertainment of livestreaming is positively significant at the level of 5%. The stronger the perceived entertainment, the more likely negative consistency is. The possible reason is that in the process of watching livestreaming, because of the personal charm, style and interactive atmosphere of the anchor, some young consumers are immersed in the pleasure of live streaming that it becomes just a pure entertainment activity; the perceived purchase efficiency passed the 1% significance in Model 2. The marginal effect indicates that when purchasing efficiency increases by one level, the probability of positive consistency between live-streaming fresh agricultural products purchasing intention and behavior increases by 4.2%, and the probability of deviation decreases by 8.3%. Consumers expect to buy what they need efficiently. The higher the efficiency of purchasing fresh agricultural products through live streaming, the more conducive to saving consumers' time, thereby promoting the transformation of purchase intention to behavior. In Model 1, the perceived convenience is significant at the 5% level, and the marginal effect shows that the perceived convenience increases by one level, the probability of positive consistency increases by 8.7%, and the probability of deviation decreases by 8.0%. Generally speaking, whether the convenience of the livestreaming transaction process is directly related to whether consumers will turn their intention into practice. Therefore, when consumers feel the convenience of purchasing fresh agricultural products through live stream, they are more inclined to translate their purchase intention into actual payment behavior. However, the perceived interactivity has not passed the significance test. This can be explained that the consumers' most important and direct goal is still to purchase satisfactory fresh products, and interactivity is an additional experience brought to consumers by the online live-streaming shopping, not a key factor.

From the perspective of demand fit, in Model 2, the service fit is significantly negative at

the 1% level. The marginal effect indicates that the level of service fit increases by one level, the probability of negative consistency will drop by 10.5%. As an emerging online shopping method, live streaming is different from traditional e-commerce online shopping services. During the live stream, real-time customer service needs to be provided. End-of-sale delivery services should be fast and timely, and after-sales service needs to protect the rights and interests of consumers, so that consumers can obtain higher service quality than traditional online shopping to meet their needs. When the live-streaming service is highly compatible with consumer needs, it is easy to trigger consumers' desire to buy and cause purchase behavior, thereby inhibiting "unwilling to buy and not to buy". The information fit does not pass the significance level test. The possible explanation is that the live stream usually uses video and host explanations to describe the product information. Most consumers can meet the information needs of fresh agricultural products. Therefore, the information fit of the live-streaming fresh agricultural products is not the main factors affecting consumers' purchase intention and the relationship between their intention and behavior.

From the perspective of perceived risk, in Model 1, the perceived risk of live-streaming fresh agricultural products is significant at a level of 5%, indicating that the perceived risk will negatively affect consumers' deviations between the purchase intention and behavior. The marginal effect indicates that the perceived risk increases by one level, the probability of the positive consistency will increase by 4.0% and the probability of deviation will decrease by 6.6%. In other words, before making a purchase decision, consumers have fully assessed the risk that the product quality may be inconsistent with its own expectations, and they can accept it and bear the risk to try.

In terms of subjective norms, in Model 1, the degree of attention to evaluation and sales is positively significant at the level of 1%, indicating that the degree of attention to evaluation and sales will positively affect the deviation of consumers' live-streaming of fresh agricultural products purchase intention and behavior. The marginal effect shows that consumers' attention to evaluation and sales increases by one level, the probability of positive consistency will decrease by 7.0%, and the probability of deviation will increase by 8.8%. The possible reason is that consumers can receive online electronic word-of-mouth information in real time, such as evaluation and sales volume. They are easier to accept other people's opinions. At this time, the medium and poor reviews will easily hinder their purchase behavior in this case. Instead, they choose to continue to wait and see, which restrains the transformation from purchase intention to behavior. The attention of Internet celebrities has passed the significance level of 5% and 1% in Model 1 and Model 2 respectively. Marginal effect shows that

consumers' attention of celebrities increases by one level, the probability of positive consistency will increase by 6.0%, and the probability of negative consistency will decrease by 6.0%. The possible reason is that celebrities act as opinion leaders. They have certain authority in live streaming and can guide consumers to purchase. However, many young consumers are often fans of the Internet celebrity, and have a certain emotional attachment to the Internet celebrity, so they tend to trust the Internet celebrity.

### Conclusion

First, consumers' intention to buy fresh agricultural products through live streaming has not completely transformed into actual purchase behavior. Consumers generally tend to express their intention to buy live-streaming fresh agricultural products, but the proportion of consumers with actual payment behavior is lower than the proportion of consumers intention to buy. There are significant differences in purchasing intentions and payment behaviors of fresh agricultural products through live webcast among independent sub-groups of consumers based on their educational level, marital status and personal monthly consumption level.

Second, deviations of consumers' online live streaming of fresh agricultural products purchase intentions and behavioral are affected by many factors. Taking the positive consistency as the reference group, the deviation between purchase intention and behavior is mainly affected by factors such as education level, marital status, trust level, perceived convenience, perceived risk, evaluation and sales attention, and the attention of Internet celebrities. In addition, except the evaluation and sales attention, the married consumers, the cognition of the live-streaming fresh agricultural products, trust level, the perceived convenience, the perceived risk, and the attention of Internet celebrities, all of them positively promote the positive consistency.

Combining the analysis results, puts forward the proposals following: Firstly, live-streaming fresh agricultural products has great potential for development. E-commerce platform merchants and fresh produce growers can actively change their marketing, applying the mode of "live streaming + fresh produce" to the marketing of fresh agricultural products flexibly. Implement precision marketing and focus on improving the purchase conversion rate of highly educated and married young consumers in the marketing of live-streaming fresh agricultural products. E-commerce platform merchants and fresh produce growers also need to enhance consumers' cognition and trust of live-streaming fresh agricultural products and build consumers' confidence. Actively promote the live-streaming fresh agricultural products, such as through government endorsement, head anchor and farmer anchor publicity to



enhance consumer cognition and trust. In addition, pay attention to improving consumers' live-streaming fresh produce purchase experience, solve the problems and improve the purchasing efficiency and convenience of consumers to the greatest extent, so that consumers can buy the fresh agricultural products they need quickly and well; Furthermore, strengthen quality to build trust in after-sales guarantee. Quality is the core of live-streaming fresh agricultural product marketing. Firmly control the quality of fresh agricultural products, and focus on real-time strict control of commodity inventory, logistics, after-sales service in order to provide excellent service quality and enhance consumer satisfaction. Merchants should attach importance to the reputation of live-streaming fresh agricultural products, and display the attributes of fresh agricultural products that consumers are most concerned about, so as to create a good product image, enhance the reputation of fresh agricultural products, and brand agricultural products. Last but not least, the influence of Internet celebrities as opinion leaders in the marketing of live-streaming fresh agricultural products should not be ignored. Maintain good relationship between celebrities and consumer groups. The emotional connection between celebrities and consumer groups will play an important role on the sale sessions through live stream and finally achieve the marketing goal of the live-streaming fresh agricultural products.

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Table 1 Basic characteristics of the sample (N=359)

Variable	Variable Interpretation	Proportion (%)	Proportion of consumers willing to buy (%)	Proportion of consumers have purchased(%)
Gender	Male	42.9	57.1	37.0
	Female	57.1	57.5	38.0
Education Level	High school or below	8.9	68.8	59.4
	College or undergraduate	75.5	54.2	33.2
	Bachelor degree or above	15.6	66.0	46.4
Marital Status	Unmarried	84.4	53.5	31.4
	Married	15.6	78.5	71.4
Personal monthly expenditure	314 dollars or below	53.2	45.0	27.2
	314 to 628 dollars	29.5	72.6	43.4
	628 dollars or above	17.3	69.4	59.7
All Sample		100	57.4	37.6

Table 2 Deviation description of consumers and their subgroups' purchase intention and behavior for live-streaming fresh agricultural products

Criteria for the classification	Subgroups	Proportion (%)			Mean	Chi square test
		Positive consistency	Deviation	Negative consistency		
Gender	Male	37.0	20.1	42.9	1.06	0.046
	Female	38.0	19.5	42.4	1.04	
Education level	High school and below	59.4	9.4	31.3	0.72	11.141**
	College or undergraduate	33.2	21.0	45.8	1.13	
	Bachelor degree or above	46.4	19.6	33.9	0.88	
Marital status	Unmarried	31.4	22.1	46.5	1.15	32.532***
	Married	71.4	7.1	21.4	0.50	
Personal monthly expenditure	314 dollars or below	27.2	17.8	55.0	1.28	37.549***
	314 to 628 dollars	43.4	29.2	27.4	0.84	
	628 dollars or above	59.7	9.7	30.6	0.71	



All Sample		37.6	19.8	42.6	1.05
Table 3 Variable description					
	Variable	Variable interpretation	Mean	Std.	
Dependent variable	Purchase intention	No=0, Yes=1	0.57	0.495	
	Purchase or not	No=0, Yes=1	0.38	0.485	
	The relationship between intention and behavior	Positive consistency=0, Deviation=1, Negative consistency =2	1.05	0.896	
Independent variable					
Individual characteristics	Gender	Female=0, Male=1	0.43	0.496	
	Education level	1-3	2.07	0.491	
	Marital status	Unmarried=0, Married=1	0.16	0.363	
Cognition and attitude	Personal monthly expenditure	1-3	1.64	0.760	
	Cognition	1-5	2.52	1.235	
live streaming experience perception	Trust level	1-5	2.82	1.197	
	Entrainment	1-5	3.31	1.187	
	Interactivity	1-5	3.26	1.230	
Demand fit	Purchase efficiency	1-5	3.09	1.252	
	Convenience		3.26	1.207	
	Service fit	1-5	3.21	1.166	
Perceived risk	Information fit	1-5	3.20	1.210	
	Perceived risk		3.01	1.160	
Subjective norms	Evaluation and sales attention	1-5	3.97	1.185	
	Attention of Internet celebrities	1-5	2.72	1.284	

Note: Strongly disagree=1, Disagree=2, Normal=3, Agree=4, Strongly agree=5

Table 4 Influencing factors of consumers' deviation of purchase intention and behavior for live-streaming fresh agricultural product

Item	Model 1(deviation/positive consistency)			Model 2(negative consistency/positive agreement)		
	Coefficients	Robust standard error	Relative risk ratio	Coefficients	Robust standard error	Relative risk ratio
Gender	0.425	0.404	1.530	0.909	0.654	2.481
Education level	-0.694*	0.404	0.500	-0.572	0.829	0.564
Marital status	-1.772***	0.621	0.170	-0.421	1.296	0.656
Personal monthly expenditure	-0.031	0.274	0.969	-0.898	0.593	0.407



Cognition	-0.319	0.220	0.727	-0.544*	0.298	0.581
Trust level	-0.436*	0.253	0.647	-2.188***	0.483	0.112
Entertainment	0.305	0.312	1.356	0.762*	0.405	2.142
Interactivity	-0.148	0.228	0.862	0.313	0.339	1.367
Purchase efficiency	-0.192	0.302	0.825	-1.941***	0.541	0.144
Convenience	-1.014**	0.499	0.363	-0.846	0.730	0.429
Service fit	-0.107	0.439	0.898	-2.342***	0.780	0.096
Information fit	-0.271	0.314	0.763	-0.418	0.372	0.658
Perceived risk	-0.576**	0.252	0.562	0.173	0.429	1.189
Evaluation and sales attention	0.907***	0.317	2.478	0.229	0.438	1.257
Attention of Internet celebrities	-0.494**	0.194	0.610	-1.649***	0.335	0.192
Constant	8.184	2.305		27.067	5.070	
Log pseudo-likelihood	-141.760					
Prob>chi2	0.000					
Wald chi2(32)	99.04					
Pseudo R2	0.625					

Note: \*, \*\*, \*\*\* indicate significant at the levels of 10%, 5%, and 1%, respectively.

Table 5 Marginal effect analysis of factors

Variable	Positive consistency		Deviation		Negative consistency	
	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error
Gender	-0.044	0.035	0.016	0.037	0.028	0.027
Education level	0.059	0.036	-0.055	0.038	-0.004	0.034
Marital status	0.136***	0.048	-0.173**	0.076	0.037	0.064
Personal monthly expenditure	0.015	0.025	0.025	0.026	-0.040*	0.023
Cognition	0.031*	0.018	-0.016	0.021	-0.015	0.013
Trust level	0.064***	0.019	0.023	0.021	-0.087***	0.013
Entertainment	-0.033	0.026	0.008	0.028	0.025	0.017
Interactivity	0.006	0.020	-0.025	0.019	0.019	0.012
Purchase efficiency	0.042*	0.025	0.041	0.027	-0.083***	0.017
Convenience	0.087**	0.042	-0.080**	0.041	-0.007	0.027
Services fit	0.042	0.038	0.063	0.042	-0.105***	0.032



Information fit	0.026	0.026	-0.015	0.030	-0.011	0.015
Perceived risk	0.040*	0.020	-0.066***	0.022	0.026	0.017
Evaluation and sales attention	-0.070***	0.025	0.088***	0.024	-0.018	0.015
Attention of Internet celebrities	0.060***	0.015	0.000	0.015	-0.060***	0.010

Note: \*, \*\*, \*\*\* indicate significant at the levels of 10%, 5%, and 1%, respectively.