

# Research on Structural Equation Model of Online Shopping Review Willingness based on Consumer Continuous Participation

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## **Abstract**

*This article takes consumers in online B2C e-commerce platforms as the research object and discusses the factors that influence consumers' continuous participation in online reviews from the perspective of consumer behavior motivation. Focusing on the user participation characteristics of the e-commerce platform commodity review system, in-depth investigation, and analysis of the factors influencing users' continued participation willingness are carried out. The model combines the expectation confirmation model with the basic characteristics of the e-commerce system. Based on synthesizing existing research, the application of the expectation confirmation model in the field of consumer behavior is expanded, and the motivation of consumers' willingness to continue participating in shopping reviews is explored. This article promotes the improvement and development of online review communities on shopping platforms to a certain extent, improves the continuous participation of consumers in online reviews of shopping, and provides practical guidance for the healthy development of shopping reviews.*

**Keywords:** *Consumers, Continuous participation, Online reviews, User reviews*

## **1. Introduction**

In online transactions, there is a wide range of information asymmetry between the seller and the buyer, and the e-commerce online comment system provides a new way to solve this problem. Different types of e-commerce platforms (such as C2C, B2C, O2O, etc.) have developed product review systems, and continue to improve review system functions and user experience, to enhance users' review participation behavior. User comments are an important part of the e-commerce process, and the continued participation of users maintains the common interests of consumers, merchants, and shopping platforms. From the perspective of consumers, consumers have certain purchase risks and uncertainties in online shopping. Based on the idea of mutual benefit, continuous participation in online reviews can reduce their risks in future online shopping, and affect consumers' purchasing decisions and consumer behavior [1]. From the perspective of merchants, user reviews can help merchants improve product quality and service levels. At the same time, there is an obvious positive correlation between the number of reviews and consumers' purchase intentions, and the continued participation of users in online reviews is the key to the number of reviews. From the platform's perspective, using user reviews as a carrier to guide consumption is still an important development strategy for e-commerce websites. Continuous user reviews can increase user stickiness and increase consumers' trust in platform content. At the same time, based on the perspective of the future

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development of e-commerce, big data and intelligent recommendations are the focus of the development of e-commerce platforms. The continuous participation of users in online reviews can help e-commerce platforms to dig deeper into user opinions and achieve precise product recommendations. However, existing research studies have shown that consumers' participation in shopping reviews is easily affected by occasional factors such as consumer sentiment and the temptation of business interests, and in general, more consumers choose automatic evaluation by the system. A large number of e-commerce shopping platforms have consumers who are not willing to participate in shopping reviews, and the phenomenon of "swiping orders" is serious. Therefore, the healthy development of e-commerce is inseparable from the continuous participation of consumers. It is necessary to explain and improve the current situation of consumers' low willingness to participate in online reviews. It is necessary to start from the motivation of consumers' review participation behavior and explore its influencing factors.

Research shows that user behavior and user's continuous use are two different but related concepts. It is generally believed that the user's continuous behavior is a linear extension of user behavior. Consumers' willingness to continue participating in online reviews defined in this article are two different research concepts from previous studies on consumers' willingness to participate in online reviews. The continuous participation of consumers in online reviews focuses on the continuous influencing factors of behavior. Existing research on the willingness to comment focuses on exploring the motivation of consumers to publish comments at a certain moment. This motivation may be affected by consumer sentiment, economic returns, Consumer involvement [2], and other sudden factors, but these studies cannot explain why consumers are often willing to continue to write reviews after shopping, that is, what factors affect consumers' continuous behavior in online reviews remains to be seen explore.

## **2. Related theoretical research**

Consumer reviews are becoming more and more important for e-commerce websites and consumer purchasing decisions. At present, there are more and more researches on consumer reviews willing by domestic and foreign researchers. The domestic and foreign research results on review intentions mainly draw on the theory of word-of-mouth communication and the theory of social exchange with the background of knowledge sharing and learn from the consumer behavior model to explore the influencing factors of consumer review behavior. For example, Tong [3] revealed the factors affecting Singaporean consumers' participation in online reviews based on social exchange theory. Wasko et al. [4] added altruism to the model, proving that altruism may be the main reason for people to contribute to knowledge. Fan [5] pointed out in the research that product type and the shopping experience will affect consumers' willingness to comment on products online. Jin et al. [6] conducted an analysis and research on Dianping.com and found that emotional commitments and normative commitments have a great impact on consumers' willingness to spread online word-of-mouth.

Compared with the initial intention, the user's continuous behavior is the key factor for the continuous application of the information system. Researchers at home and abroad have made great progress in the study of sustained behavior intention, and the scope of research has been continuously expanded. For example, Park et al. [7] conducted related research on the company's willingness to continue using the company's website analysis service and found that customer satisfaction is the biggest influencing factor. Lin et al. [8] found that the learning effect and subjective norms of users will affect their willingness to continue using the video teaching system by Spanish students. Zhu et al. [9] used the technology acceptance model to

construct a model to study the impact of consumers' continued use of travel websites. With the rise of social network platforms. Kim [10] used a fine processing model to explore the relationship between consumer attitudes and the continued use of Twitter. Park et al. [11] combined incentive theory and post-adaptation model and found that user SNS literacy has a greater impact on the continuous use intention of SNS services.

After a large amount of literature review and careful combing, it is found that although the research on consumers' online comment willingness has produced certain research results [11], there has been no further discussion on the factors affecting consumers' continuous participation in online comments at home and abroad. Therefore, this article will build a Structural Equation Modeling (SEM) based on the expectation confirmation model, combined with the enlightenment of the existing research results of review willingness, through the analysis of the external incentives of the platform experience and the internal psychological factors of the consumers. An in-depth explanation of consumers' willingness to continue participating in online reviews.

### 3. Research models and assumptions

#### 3.1. Expecting confirmation model

The Expectation Confirmation Method (ECM) was created by Bhattacharjee [12] based on the Expectation Confirmation Theory proposed by Oliver [13]. This model is often used to study the continuous use of information systems. This model focuses on the post-purchase behavior of users and believes that consumers' continued use of a system is affected by three factors after use: perceived usefulness, degree of expected confirmation, and satisfaction. Bhattacharjee [12] found through empirical research that satisfaction is the most important factor that affects users' continuous use of information systems, and perceived usefulness indirectly affects users' willingness to continue to use through its impact on satisfaction, and also has a direct impact on continued use intentions. The relationship between these four factors is shown in Figure 1. In recent years, the expectation confirmation model and its extension model have been continuously used by researchers and users in the field of information systems in the Internet field. Stone et al. [14] studied the relationship between student expectations, confirmation, and continued use of e-textbooks. Dennis et al. [15] integrated the expectation confirmation theory and technology acceptance model to discuss the factors that affect consumers' continued online purchases.

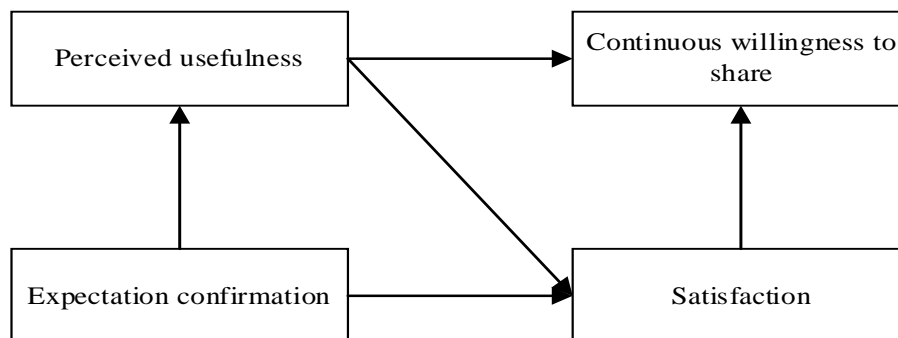


Figure 1. Expectation confirmation method

Hsu et al. [16] extended the expectation confirmation model to the study of the continuous use of social network applications. The study found that use-value, emotional value, social value, and altruistic value all positively affect user satisfaction and willingness to continue using perceptual value variables. Some researchers use the Expectation Confirmation Theory to do related research on the willingness to continue using social media tools such as WeChat and mobile payment. In summary, it is expected that the confirmation model has good applicability in studying the user's willingness to continue to use.

### 3.2. Research hypothesis

Based on the expected confirmation theory, and based on the existing theories and literature support, seven latent variables, namely perceived ease of use, perceived self-worth, perceived fun, expected reciprocal relationship, perceived usefulness, expectation confirmation, and satisfaction, were selected to construct a model of consumers' willingness to continue to participate in the online evaluation as shown in [Figure 2]:

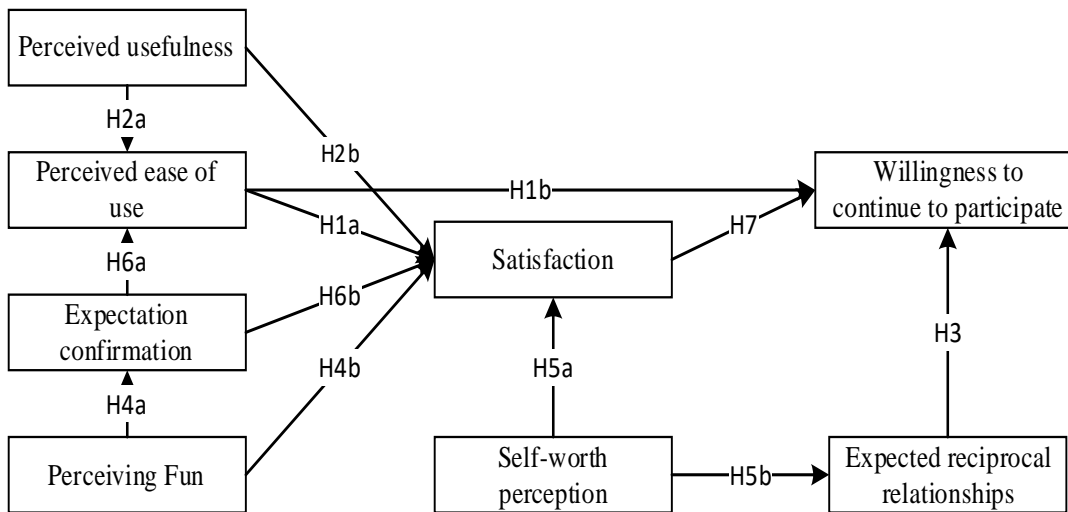


Figure 2. The model of consumers' willingness to continue to participate in the online evaluation

Perceived usefulness is an important research variable in the Technology Acceptance Model (TAM), which reflects the degree to which a person believes that using a specific system improves his work performance [17]. It has been confirmed in previous studies that perceived usefulness has a significant impact on the acceptance of information technology [18], government mobile e-government applications [19], and online shopping [20]. This article believes that in the context of continuous sharing of review information, perceived usefulness can be defined as how useful consumers share consumer reviews for themselves. When consumers feel that participating in online reviews is useful, their satisfaction will increase, and it will also promote more active participation in online shopping reviews. Based on this, this article assumes:

H1a: Perceived usefulness significantly affects consumer satisfaction.

H1b: Perceived usefulness significantly affects consumers' willingness to continue participating in online shopping reviews.

Davis [17] defines perceived ease of use as "how easy it is for users to use this technology", which reflects the convenience and ease of consumers in the process of using computer systems, which directly affects users' willingness to use information systems. Research from Liu et al. [20] and Lee et al. [21] believe that whether an information system is easy to use will greatly affect the user's experience. The more complex the use process, the weaker the user's willingness to use. Consumer shopping comment participation behavior is separated from previous shopping activities. During the actual participation in shopping reviews, consumers need to log in to the shopping website again to confirm payment and write shopping reviews. It will invisibly increase the time execution cost and use the burden of consumers. Once the user feels the cumbersome use process, the user is likely to give up participating in the review. And according to the technology acceptance model, it is shown that the perceived ease of use has a positively correlated effect on the perceived usefulness [22]. Based on this, this article assumes:

H2a: Perceived ease of use significantly affects perceived usefulness.

H2b: Perceived ease of use significantly affects consumer satisfaction.

Social exchange theory [23] emphasizes that all human behaviors are dominated by exchange activities that can bring benefits or rewards, and reciprocity is exactly the "benefits" or "rewards" shown by such social exchange activities. Studies have shown that there are extensive mutually beneficial behaviors in virtual communities, online forums, and social networking sites [24]. Similarly, there are also mutually beneficial social exchange behaviors in the process of consumers participating in shopping reviews. This article anticipates that reciprocal relationships refer to the desire of individuals to maintain constant relationships with others. Consumers' comments and information can be regarded as an expected reciprocal investment in their future behavior—that is, they expect to obtain reliable information when they need to refer to the evaluations of other consumers in the future. This is a mutually-win-win game behavior. Therefore, when people can anticipate the future benefits of their actions, the behavior of comments will continue. Based on this, this article assumes:

H3: The expected reciprocal relationship significantly affects consumers' willingness to continue participating in online shopping reviews.

Lin et al. [25] found that perceptual interest is the most influential factor in the process of human-computer interaction when studying the continuous use of portals. Perceived interest as a user's inner psychological activity reflects the interesting, fun, and psychologically happy state that the user feels in the process of interacting with the environment. At present, perceived interest has been largely introduced into the research on Internet activities. For example, Hsu et al. [26] studied the positive relationship between perceived entertainment and website shopping satisfaction. Research by Lin et al. found that perceived entertainment can affect young consumers' beliefs in using mobile communication services. And Yeh et al. [27] pointed out in the continuous use of social networking sites that perceived entertainment can positively affect user satisfaction and expectations. These studies show that adding perceptual interest to the model will increase the explanatory power and predictive power of the model. Based on this, this article assumes that consumers continue to participate in the process of online shopping reviews:

H4a: Perceived interest significantly affects the degree of confirmation that consumers expect.

H4b: Perceived interest significantly affects user satisfaction.

Self-worth perception [28] is the core concept in Bandura's social cognitive theory, based on the strong demand for self-recognition by others. Literature [29] also pointed out that the activities that keep people happy for a long time are not because of the stimulation of external rewards, but because people's value is highlighted. The definition of self-worth perception in this article is the consumer's perception of the value of writing shopping reviews in the process of participating in shopping reviews. This user's perception of self-worth still exists in Internet consumer behavior. For example, Stefanone et al. [30] found in the study of social networking sites that the perception of self-worth is related to the intensity of the behavior of continuously sharing photos. Self-worth perception is at the highest level of Maslow's hierarchy of needs theory, and this spiritual level of "reward" can bring more satisfaction to users than material rewards and can stimulate people's desire for continuous use. Based on this, this article assumes.

H5a: Self-worth perception significantly affects user satisfaction.

H5b: The perception of self-worth significantly affects the formation of consumer reciprocal relationships.

Expected confirmation refers to the gap between the actual performance perceived by users after using a product or service and the expected performance before use. Since the expectation confirmation model was proposed, many scholars have done a lot of research using the expectation confirmation model and conducted related tests on the role of the expectation confirmation degree in the model. The expectation confirmation degree has a positively significant relationship with consumer satisfaction. The degree of expected confirmation in this study refers to consumers' perception of the consistency between expected performance and actual performance of participating shopping reviews. If the actual performance perceived by online shoppers for participating in online reviews is less than the expected performance, the consumer's satisfaction will decrease, and vice versa, it will have a positive effect on satisfaction. Based on this, this article assumes:

H6a: The degree of confirmation is expected to significantly affect perceived usefulness.

H6b: It is expected that the degree of confirmation will significantly affect user satisfaction.

Satisfaction is the most important intermediary variable in expectation confirmation theory, referring to the definition of satisfaction by Bhattacharjee and Oliver. This article believes that satisfaction is the emotional state of users after sharing shopping reviews, such as satisfied or dissatisfied, happy or disappointed, etc. In recent years, studies on users' willingness to continue to use have shown [31][32][33] that satisfaction has a strong influence on users' willingness to continue to use. Similarly, in the context of consumers sharing shopping reviews, it is also confirmed that a large part of the antecedents of consumers posting user reviews are product satisfaction. Whether it is inferred that the more satisfied users are with the results of sharing shopping reviews, the stronger their willingness to continue sharing shopping reviews in the future. Based on this, this article assumes:

H7: Satisfaction significantly affects consumers' willingness to continue participating in online reviews.

#### **4. Research design and data collection**

The research model includes 7 latent variables, and each latent variable is measured by multiple indicators, and at the same time, to ensure the validity and reliability of the scale. All measurement items come from existing research and mature domestic and foreign research scales, and they have been improved and adapted in combination with actual research questions

to ensure that they meet the needs of specific research scenarios. The questionnaire is compiled using a Likert 5-level scale, with 1 to 5 indicating very non-conforming, not very conforming, general, conforming, and very conforming respectively. The measurement items and sources of specific variables are shown in [Table 1]. The questionnaire also collected demographic data (gender, age, education level) and the number of comments made by the respondents.

Table 1. The measurement items

Variable	Measure content
PEOU	PEOU1: Participating in online shopping reviews will not cost me too much time and effort
	PEOU2: The process of participating in online shopping reviews will not be very troublesome
	PEOU3: There are not many steps to participate in online shopping reviews
UVP	UVP1: Participating in online shopping reviews can help other online shopping consumers to better understand product/merchant information
	UVP2: Participating in online shopping reviews can help other online shoppers make reasonable shopping decisions
	UVP3: Participating in online shopping reviews can help sellers improve product quality and service attitude
	UVP4: I think participating in online shopping reviews is a matter of realizing self-worth
PF	PF1: Participating in online shopping reviews and recommending products you like to others is a very happy thing
	PF2: Participating in online shopping reviews, complaining about product defects or merchant services, is a very interesting thing
	PF3: Participating in online shopping reviews, posting pictures, and sharing experiences, is a very interesting thing
	PF4: Participating in online shopping reviews and getting the approval and response of other buyers is an exciting thing
ERB	ERB1: When shopping online, other consumers' shopping reviews are helpful to me. Therefore, I also participate in online shopping reviews to help other consumers. This is a fair thing.
	ERB2: When I take the initiative to share shopping reviews with others as reference information, I believe that other consumers are also willing to take the initiative to share shopping reviews with me as reference information for shopping
	ERB3: I participate in online shopping reviews so that in the future when I also need to refer to other people's reviews, I can obtain reliable review information from other consumers
	ERB4: I think participating in online shopping reviews is a kind of self-interested behavior
CFM	CFM1: I confirm that positive/negative shopping reviews of online reviews can get positive responses from sellers
	CFM2: I expected all the rewards for online reviews
	CFM3: I confirm that the shopping reviews I shared online have helped merchants and other consumers
	CFM4: In short, the results of my participation in online shopping reviews were better than I expected
PU	PU1: Participating in online shopping reviews helps me get better products/merchant services
	PU2: Participating in online shopping reviews can help me vent my dissatisfied/satisfied shopping emotions
	PU3: Participating in online shopping reviews can earn me material/spiritual rewards
	PU4: Participating in online shopping reviews helps me give feedback on the quality of goods or services
SAT	SAT1: I think participating in online shopping reviews is a meaningful behavior
	SAT2: Participating in the process of using online shopping reviews makes me satisfied
	SAT3: I am satisfied with the results of participating in online shopping reviews
CI	CI1: In the future, I will continue to participate in online shopping reviews after online shopping
	CI2: In the future, I am willing to persuade others to participate in online shopping reviews
	CI3: In the future, I am willing to fill in shopping reviews seriously and in detail

After the questionnaire is designed, this article first conducts a small-scale trial survey among users who have participated in online shopping reviews. According to their feedback, the questionnaire expression is partially modified to make the questionnaire easier to understand. Taking into account the diversity of review information publishing platforms, the research selects the B2C shopping platform review system as the research object and takes users who have online shopping experience and published review information as the target group of the questionnaire survey. This article uses online questionnaires and publishes questionnaire links through QQ groups, Tieba, and social networking sites. A total of 155 online questionnaires have been collected. At the same time, 100 paper questionnaires were issued, 100 questionnaires were returned, and a total of 255 questionnaires were returned. Excluding questionnaires with 0 sharing shopping reviews, questionnaires filled in within 2 minutes, and questionnaires with the same answer checked, a total of 212 valid questionnaires were obtained, with an effective rate of 83.14%. The actual effective questionnaire is larger than the theoretically required effective sample amount.

## 5. Data analysis

Data analysis mainly uses a two-stage methodology-measurement model and structural model. The measurement model describes how variables are measured or conceptualized by corresponding explicit indicators, which are mainly measured by reliability and validity. The structural model refers to the relationship between the latent variables and the part of the variance that cannot be explained by other variables in the model, and the structural equation model is used to verify [34]. Before analyzing the data, you need to use SPSS to do a preliminary sample test to determine whether the sample is suitable for factor analysis. Mainly examine KMO and Bartlett's test and Cronbach's Alpha test. Among them, KMO and Bartlett's test is an indicator to compare the simple correlation coefficient and the partial correlation coefficient between variables. The closer the KMO is to 1, and the more significant Bartlett's chi-square value, the stronger the correlation between the variables, the more suitable for factor analysis. Cronbach's Alpha is a reliability test, which is used to test the overall reliability of a sample. The closer its value is to 1, the better. It can be seen from Table 2 that the KMO value of this questionnaire is 0.907, and Bartlett's chi-square value is 3461.791. 791 is significant at  $p < 0.001$ , and the overall reliability of the sample is close to 1, which means that the basic test result of the sample is consistent with Factor analysis conditions.

Table 2. A basic inspection of samples

	KMO	0.907
Bartlett's Test of Sphericity	Approx. Chi-Square	3461.791
	df	406
	Sig.	0
	Cronbach's Alpha	0.94

### 5.1. Measurement model

In the measurement model, AMOS17.0 is used to perform confirmatory factor analysis on the variables in the model. As shown in [Table 3], the table lists the Cronbach's Alpha coefficient, AVE, and its root means square, CR, and the correlation coefficient between each construct. It can be seen that the Cronbach's  $\alpha$  value of each construct is above 0.7, indicating that the internal consistency of each measurement item of the scale is better, and its AVE value is also greater than 0.5, indicating that the convergence validity of the scale satisfies the



appropriate Matching requirements. The CR value of each construct is also greater than 0.7, indicating that the scale has good composite reliability. The off-diagonal elements in Table 3 are the correlation coefficients of each dependent variable. According to the discriminant validity test requirements, the diagonal elements should be larger than the off-diagonal elements, and the discriminant validity of this scale is better. On the whole, all indicators of the scale meet the requirements of reliability and validity testing.

Table 3. Table lists of parameters

	Cronbach's Alpha	AVE	CR	UVP	PE	PEOU	CEM	PU	SAT	ERB	CI
UVP	0.784	0.545	0.823	0.738	-	-	-	-	-	-	-
PF	0.761	0.505	0.803	0.68	0.711	-	-	-	-	-	-
PEOU	0.82	0.614	0.824	0.483	0.535	0.7836	-	-	-	-	-
CFM	0.766	0.506	0.8036	0.544	0.801	0.428	0.711	-	-	-	-
PU	0.751	0.51	0.806	0.506	0.732	0.437	0.899	0.714	-	-	-
SAT	0.775	0.578	0.804	0.689	0.824	0.563	0.814	0.82	0.76	-	-
ERB	0.821	0.524	0.8141	0.777	0.528	0.375	0.423	0.393	0.535	0.724	-
CI	0.812	0.577	0.803	0.674	0.722	0.492	0.703	0.707	0.846	0.617	0.759

## 5.2. Structural model

The measurement of the structural model uses the model fitting index to examine the degree to which the theoretical structural model fits the data. Different types of fitting indices can be used to measure theoretical models in terms of model complexity, sample size, relativity, and absoluteness. Commonly used fitting indexes and their best fitting indexes are shown in [Table 4]. From the comparison results in [Table 4], it can be seen that the fitting data of the model constructed in this study are very close to the best fitting index. On the whole, the fit of the model is at an acceptable level.

Table 4. Fitting indexes

Indicators	Recommended Value	Our Value	Evaluation
CMIN/DE	<5.0(Bentler)	2.448	Good
CFI(Absolute factor)	>0.8(etezadi-amolo)	0.783	Acceptable
CF (Appearance factor)	>0.9(Havduk)	0.841	Acceptable
RMSEA	0<0.1(Browne)	0.083	Acceptable

## 5.3. Model verification

This study uses AMOS17. The O software performs model hypothesis verification and calculates the path coefficients between the variables. The detailed results are shown in [Table 5], and the path coefficients and significance level SEM analysis diagrams are drawn according to the results, as shown in [Figure 3]. It can be seen from [Table 5] and [Figure 3] that, except

for H1b, H2a, and H6b, the assumptions in the model are that perceived usefulness has no effect on continued participation willingness, perceived ease of use has an effect on perceived usefulness, and expectation confirmation has no effect on satisfaction. Also, to support, other hypotheses have been verified.

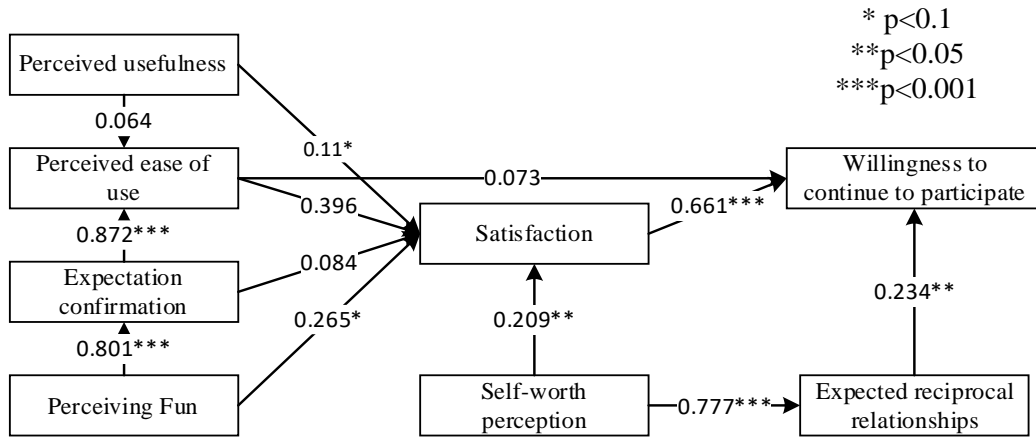


Figure 3. Results of hypothesis testing

Table 5. Results of hypothesis testing

No.	Hypotheses	Conclusion
H1a	Perceived usefulness significantly affects consumer satisfaction	support
H1b	Perceived usefulness significantly affects consumers' willingness to participate continuously in online shopping reviews.	unsupported
H2a	Perceived ease of use significantly affects perceived usefulness	unsupported
H2b	Perceived ease of use significantly affects consumer satisfaction	support
H3	Expected reciprocity significantly affects consumers' willingness to participate continuously in online shopping reviews	support
H4a	Perceived fun significantly affects consumers' expectation confirmation	support
H4b	Perceived fun significantly affects user satisfaction	support
H5a	Perceived self-worth significantly affects user satisfaction	support
H5b	Perceived self-worth significantly affects the formation of reciprocal relationships among consumers	support
H6a	Expectation confirmation significantly affected perceived usefulness	support
H6b	Expectation validation significantly affects user satisfaction	unsupported
H7	Satisfaction significantly affects consumers' willingness to participate continuously in online reviews	support

## 6. Conclusion

The willingness of consumers to continue to share is of great significance to the reliability, credibility, and effectiveness of shopping review content, as well as the healthy and stable development of the shopping review community. Through literature review and theoretical analysis, with the expectation confirmation theory as the basic framework, through the introduction of new variables and the needs of specific research scenarios, a theoretical model of consumers' willingness to participate in online shopping reviews was obtained, and the model was verified through empirical studies. The experiment verified the applicability of the

expectation confirmation model proposed by Bhattacharjee in the continuous sharing behavior of consumer shopping reviews. The model summarizes the micro-mechanism of consumers' continued participation in online shopping reviews, that is, it is found that the expected reciprocal relationship is the main direct motivation for consumers to continue participating in online shopping reviews. Perceived usefulness, perceived ease of use, perceived interest, and perception of self-worth indirectly affect consumers' satisfaction and their willingness to continue participating in online shopping reviews, that is, satisfaction is the most important intermediary variable of consumer behavior. The degree of expected confirmation has a less obvious impact on consumer satisfaction in this study, but it significantly affects consumers' perceived usefulness.

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