JKSCI

한국컴퓨터정보학회논문지
Journal of The Korea Society of Computer and Information
Vol. 28 No. 10, pp. 277-289, October 2023
https://doi.org/10.9708/jksci.2023.28.10.277

A Study on Consumers' Continuance Intention in Live Streaming E-commerce Shopping

Yongfeng Hu*, Chi Gong*

*Student, Department of Global Business, Kyonggi University, Suwon, Korea
*Professor, Department of Global Business, Kyonggi University, Suwon, Korea

[Abstract]

The purpose of this study is to explore the mechanisms influencing consumers' continued intention to use live-streaming e-commerce for shopping, providing strategic recommendations for businesses to optimize live-streaming activities and enhance consumers' shopping experiences. In this paper, we innovatively integrate the UTAUT2 and ECM theoretical models to construct a comprehensive research framework. This framework not only thoroughly reveals the multi-dimensional variables that affect consumers' continuous usage intentions but also delves deeply into the interrelationships among these variables. We collected data extensively through surveys and utilized the Structural Equation Modeling and Bootstrapping methods for analysis. The research results indicate that performance expectation plays a crucial role in determining the continuous usage intention; satisfaction exerts a significant mediating effect between performance expectation and four other variables concerning continuous usage intention; and expectation confirmation stands out as the most prominent factor in enhancing satisfaction.

▸ **Key words**: live streaming e-commerce shopping, consumers, continuance intention, UTAUT2, ECM

[요 약]

이 연구의 목적은 소비자들이 라이브 스트리밍 전자상거래에 대한 지속적인 사용 의도에 영향을 주는 메커니즘을 탐구하고, 기업들이 라이브 스트리밍 활동을 최적화하고 소비자의 쇼핑 경험을 향상시키기 위한 전략적 제안을 제공하는 것입니다. 본 논문에서는 UTAUT2와 ECM 두 가지 이론 모델을 창의적으로 결합하여 종합 연구 프레임워크를 구축하였습니다. 이 프레임워크는 소비자의 지속적 사용 의도에 영향을 주는 다차원 변수를 전반적으로 밝혀냄과 동시에 각 변수들 간의 상호 관계에 대해 깊게 탐구하였습니다. 우리는 설문 조사를 통해 데이터를 광범위하게 수집하였고, 구조방정식 모델링 및 Bootstrapping 방법을 사용하여 분석하였습니다. 연구 결과 성과 예상이 지속적 사용 의도 결정에서 핵심 역할을 하는 것으로 밝혀졌으며; 만족도는 성과 예상 등 4개의 변수와 지속적 사용 의도 사이에서 중요한 매개 효과를 나타냈으며; 기대 확인도는 만족도 향상 측면에서 가장 두드러진 결과를 보였습니다.

▸ **주제어**: 라이브 커머스 쇼핑, 소비자, 지속 사용 의도, UTAUT2, ECM

• First Author: Yongfeng Hu, Corresponding Author: Chi Gong
*Yongfeng Hu (35113621@qq.com), Department of Global Business, Kyonggi University
*Chi Gong (gongchi@kyonggi.ac.kr), Department of Global Business, Kyonggi University
• Received: 2023. 09. 11, Revised: 2023. 10. 16, Accepted: 2023. 10. 16.

http://www.ksci.re.kr pISSN:1598-849X | eISSN:2383-9945

I. Introduction

With the rapid development of information technology, new business models continue to evolve. Live streaming e-commerce has gradually emerged as a significant platform for product promotion in the e-commerce sector. Taking China as an example, the 51st Statistical Report on Internet Development in China reveals that as of December 2022, the number of live streaming e-commerce users in China had reached 515 million, making up 48.2% of the total internet users, marking an increase of 51.05 million compared to December 2021.

Live streaming e-commerce is a novel sales approach wherein broadcasters employ live streaming technologies on digital platforms to display products, answer queries, and guide prospective customers [1]. Compared to traditional e-commerce, live streaming e-commerce allows real-time interaction between viewers and hosts, facilitating viewers' better understanding of products. It not only enriches consumers' shopping channels but also enhance their shopping experiences.

Currently, research on consumer behavior in e-commerce mainly focuses on traditional e-commerce, with limited studies on live streaming e-commerce. Existing research primarily revolves around purchase decisions and influencing factors, host characteristics, and live streaming marketing. However, research is scant regarding consumers' continued repurchasing intention within the live streaming e-commerce environment [2]. Considering the rapidly expanding market and distinct features such as real-time interaction, social shopping attributes, and fan economy within live streaming e-commerce, current theories are insufficient to fully elucidate consumers' repurchase intentions in this context[3]. Therefore, this study aims to integrate the second-generation Unified Theory of Acceptance and Use of Technology (UTAUT2) and the Expectation Confirmation Theory in Information Systems (ECM) to construct a research model that explores the factors influencing consumers' repurchase intention in the context of live streaming e-commerce. The aim is to explore the impact path of live streaming e-commerce on consumers' continuance purchase intention. The insights from this study aim to enhance consumer experiences in live streaming shopping and provide both theoretical underpinnings and practical references for businesses operating in the live streaming e-commerce sector, consequently fostering the industry's robust growth.

II. Literature Review and Theoretical Foundation

1. Continuance Intention

In recent years, scholars have delved deeper into researching on users' continuance intention. Continuance intention refers to the user's intention to continue using an information system after the initial adoption [4]. In order to establish long-term and stable customer relationships, it is crucial to sustain users' continuance intention [5]. Therefore, compared to initial usage, sustaining users' continual use is the key factor [4]. Continuance intention has received significant research attention in the fields of information systems [6], mobile applications [7], social media [8], education [9], and other domains, and its importance is widely recognized. Shopping behavior is characterized by high frequency and multiple channels and modes. In a highly competitive environment, maintaining high user stickiness is critical for businesses. Therefore, investigating the factors influencing consumers' continuance intention is of great significance. Although some scholars have begun to explore users' continuance intention in the context of e-commerce [10], there is limited research in the emerging field of live-streaming e-commerce. This study aims to

propose a research model through literature review, and validate it, that influences the continuance intention of consumers in live-streaming e-commerce.

2. UTAUT2 Theory

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. by integrating eight theoretical models, including the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Motivational Model (MM), and the Model of PC Utilization (MPCU). This theory constructs a model framework of technology acceptance and usage behavior with performance expectancy, effort expectancy, social influence, and facilitating conditions as determinants, and gender, age, experience, and voluntariness as moderating factors [10]. To delve deeper into the acceptance and behavior towards technology in non-organizational settings, Venkatesh et al. enhanced the original UTAUT model and proposed the UTAUT2 model in 2012. This model added three variables: hedonic motivation, price value, and habit, while removing voluntariness as a moderating variable [11]. The adaptability of the UTAUT2 model extends to individual consumer domains, with an explanatory power of 74%, surpassing the UTAUT theory [12]. UTAUT2 has been cited over 16,000 times and has been validated in various research fields, such as e-commerce [13], e-government [14], mobile payment [15], and mobile learning [16].

The selection of UTAUT2 theory is justified on two grounds. Firstly, it lays the foundation for research in the field of technology acceptance and use by integrating multiple classical theories and models, thus providing a comprehensive and systematic theoretical framework. Secondly, its extended application in consumer contexts makes it well-suited to the live-streaming e-commerce shopping scenario. This enables a clear understanding of the critical dimensions affecting consumers' repurchase intentions, thus fully grasping the formation mechanism of consumers' repurchase intentions.

3. Expectation-Confirmation Model (ECM)

The Expectation-Confirmation Theory (ECT) was put forward by Oliver in 1980 to delve into the issues of product repurchase[17]. In 2001, Bhattacherjee [4] developed a new Information System Expectation-Confirmation Model (ECM) by incorporating perceived usefulness based on the Expectation-Confirmation Model. In the ECM model, "satisfaction" serves as an intermediary variable that compares individuals' pre-usage expectations with their perceived outcomes after actual usage, thus determining the level of satisfaction and serving as a reference for enhancing continuance intention. Researchers have combined the Expectation-Confirmation Theory with various theories depending on the context of their research. For instance, the Expectation-Confirmation Theory has been merged with the Flow Theory to jointly study the factors affecting user stickiness on video websites [18]. It has also been combined with the Success Theory to construct a model for studying mobile group buying users' continuance intention [19]. In addition, the combination of the Expectation-Confirmation Theory with the UTAUT2 Theory and IDT Theory has been used to develop a model for studying academic users' continuance intention in mobile visual search [20]. Furthermore, the Expectation-Confirmation Theory has been combined with the Self-Efficacy Theory to examine users' continued usage behavior in e-book reading [21]. Adopting this approach, this paper integrates the Information System Expectation-Confirmation Model with the UTAUT2 theory to analyze the continuous use intention of users in the context of live-streaming e-commerce.

III. Research Model and Hypothese

1. Research Model

The field of e-commerce is rapidly evolving and has profound impacts. Live-streaming e-commerce, as one of the most recent business models, presents new features in its research context that deviate from the UTAUT2 model. In the current digital environment, functions such as "watching live streams" and "mobile payments" have become increasingly common due to the prevalence of new media. Mobile devices such as smartphones provide consumers with convenient conditions for watching live streams and making instant payments anytime and anywhere, eliminating the need for consumers to be restricted by their physical environment. Therefore, the variable "facilitating conditions" can be removed. Additionally, live-streaming platforms and enterprise live rooms are open to consumers free of charge. Considering this, the variable "price value" can be eliminated. Furthermore, the population using live-streaming e-commerce for shopping shows a relatively balanced distribution in terms of age and gender, with most consumers having experience in live-streaming shopping and minimal differences in terms of moderating effects. Therefore, the moderating variables "gender," "age," and "experience" can be excluded. In conclusion, based on the UTAUT2 model, five influencing factors are extracted: performance expectancy, effort expectancy, social influence, hedonic motivation, and habit..

Both the ECM and UTAUT2 models are theoretical frameworks employed to study the acceptance of information technology. The variable "perceived usefulness" in the ECM model and the variable "performance expectancy" in the UTAUT2 model both represent users' evaluation of benefits. Therefore, it is reasonable to consider merging them. In addition, the independent variable "expectation confirmation" from the ECM model can be introduced, with "satisfaction" serving as a mediating variable, to explore the impact mechanisms of different perceived variables on continuance intention.

In summary, this paper integrates the UTAUT2 and ECM models, proposing a research model for the continuance intention of consumers in live-streaming e-commerce (see Figure 1).

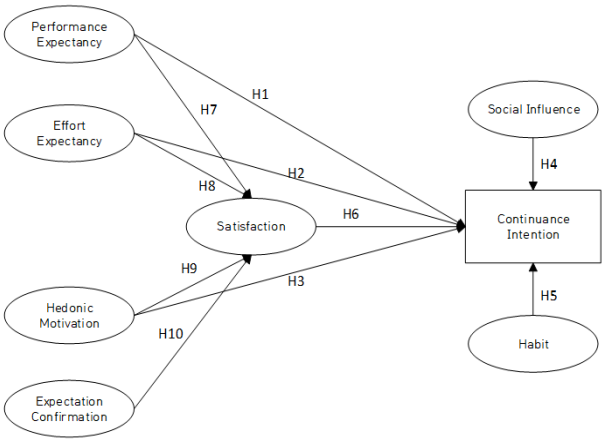

Fig. 1. Research Model

2. Research Hypotheses

2.1 Hypotheses Based on the UTAUT2 Model

(1) Relationship between Performance Expectancy(PE), Effort Expectancy(EE), and Continuance Intention(CI)

According to the UTAUT2 theory, performance expectancy refers to the extent to which users believe that using a certain technology will help improve their job performance, while effort expectancy refers to the perceived ease of use of that technology. In the context of this study, performance expectancy is defined as consumers' perception of whether using live-streaming e-commerce is beneficial in achieving their shopping goals [22], while effort expectancy refers to consumers' perception of the ease of using live-streaming e-commerce for shopping [23]. The UTAUT2 model has already confirmed the significant impact of performance expectancy and effort expectancy on intention to use. Furthermore, previous studies have shown that performance expectancy and effort expectancy can increase consumers' intention to participate continuously in the service-oriented sharing economy [24], and

El-Masri et al. found that users with higher performance expectancy for online learning platforms also exhibit higher intention to continue using them [25]. This study posits that if consumers have successfully achieved their shopping goals through using live-streaming e-commerce, they will develop a positive attitude toward it, thus enhancing their intention to use it again. Similarly, if consumers find that using live-streaming e-commerce for shopping is easy, convenient, and efficient, their future intention to continue using it will correspondingly increase. Based on this, the following hypotheses are proposed:

H1: Consumers' performance expectancy of live-streaming e-commerce has a positive impact on their intention to continue using it.

H2: Consumers' effort expectancy of live-streaming e-commerce has a positive impact on their intention to continue using it.

(2) Relationship between Hedonic Motivation(HM), Social Influence(SI), Habit(HT), and Continuance Intention(CI)

Hedonic motivation refers to the expectation of experiencing pleasure and enjoyment during the process of technology use [11]. In this study, hedonic motivation is defined as consumers' subjective expectation of deriving pleasure during the shopping process on live-streaming e-commerce platforms. Yuan et al. found that both hedonic motivation and habit significantly influence users' intention to continue using fitness applications [26]. Additionally, Ali suggests that hedonic motivation has a positive impact on users' continuance intention toward mobile food ordering applications [27]. In the context of this research, live-streaming e-commerce platforms typically provide three-dimensional product displays and entertaining shopping experiences, which to some extent enhance consumers' intention to continue using them. Based on this, the following hypothesis is proposed:

H3: Consumers' hedonic motivation toward live-streaming e-commerce has a positive impact on their intention to continue using it.

In the UTAUT2 theory, social influence refers to the impact of surrounding groups on individual adoption of new technology. The bandwagon effect suggests that most people in society have a tendency to conform and are easily influenced by others. Numerous scholars, such as Venkatesh et al. [10] and Zeng Jing [28], have conducted extensive research to confirm the influence of social influence on users' intention to use. In this study, social influence refers to the influence of the social environment and significant individuals in consumers' lives when they use live-streaming e-commerce for shopping. When these influences have a positive effect, they will encourage consumers to accept live-streaming e-commerce for shopping and increase their intention to continue using it. Based on this, the following hypothesis is proposed:

H4: Consumers' social influence has a positive impact on their intention to continue using live-streaming e-commerce.

Once users develop a habit for a particular technology, it promotes their intention to continue using it [29]. According to Gefen's research, habit has a significant positive impact on users' continuance intention in online shopping [30]. Studies on the use of short video apps also indicate that habit directly influences users' intention to continue using them [31]. Similarly, once consumers become accustomed to a certain shopping method, they unconsciously choose to continue using it. Based on this, the following hypothesis is proposed:

H5: Consumers' habit positively influences their continuance intention toward live-streaming e-commerce.

2.2 Hypotheses Based on the ECM Model

(1) Relationship between Satisfaction(SA) and Continuance Intention(CI)

In the context of this study, continuance intention is defined as consumers' inclination to

continue using live-streaming e-commerce in the future. Satisfaction is defined as the psychological state formed by consumers' perception of the effectiveness and expected value of using live-streaming e-commerce for shopping. Bhattacherjee confirmed in the ECM model that satisfaction is an important factor determining users' intention to continue using, and multiple empirical studies have also demonstrated the direct impact of satisfaction on consumers' continuance intention (Liu Zhenhua, 2017 [32]; Wang Wei, 2014 [33]). The more satisfied consumers are with their experience of using live-streaming e-commerce for shopping, the stronger their intention to continue using it. Based on this, the following hypothesis is proposed:

H6: Consumer satisfaction positively influences their intention to continue using live-streaming e-commerce.

(2) Relationship between Performance Expectancy(PE), Effort Expectancy(EE), Hedonic Motivation(HM), and Satisfaction(SA)

Performance expectancy, effort expectancy, and hedonic motivation are important measures of information systems. In several existing studies, scholars have validated the significant impact of performance expectancy, effort expectancy, and hedonic motivation on user satisfaction in various domains, such as learning technologies [34], mobile information services [35], mobile food ordering services [27], and internet healthcare [36]. This study posits that when consumers perceive more benefits, ease of use, and enjoyment from using live-streaming e-commerce for shopping, their satisfaction with live-streaming e-commerce will increase. Based on this, the following hypotheses are proposed:

H7: Consumers' performance expectancy of live-streaming e-commerce positively influences their satisfaction.

H8: Consumers' effort expectancy of live-streaming e-commerce positively influences their satisfaction.

H9: Consumers' hedonic motivation toward live-streaming e-commerce positively influences their satisfaction.

(3) Relationship between Expectation Confirmation(EC) and Satisfaction(SA)

In the ECM model, expectation confirmation refers to the degree to which information system users' pre-usage expectations are confirmed after usage. In this study, expectation confirmation is defined as consumers' evaluation of the extent to which their pre-usage expectations regarding the use of live-streaming e-commerce for shopping are confirmed. Expectation confirmation has been confirmed in the ECM model as a primary factor directly influencing user satisfaction. The higher the degree of confirmation consumers perceive regarding their expectations of using live-streaming e-commerce for shopping, the higher their satisfaction. Based on this, the following hypothesis is proposed:

H10: Consumers' expectation confirmation positively influences their satisfaction with live-streaming e-commerce.

IV. Research Design

1. Questionnaire Design

The research model incorporates a total of 8 latent variables: independent variables (performance expectancy, effort expectancy, hedonic motivation, social influence, habit, expectation confirmation), mediating variable (satisfaction), and dependent variable (continuance intention). The questionnaire is designed using a Likert 5-point scale, drawing on established measurement scales. The questionnaire is divided into two parts: The first part captures respondents' demographic characteristics, and the second part consists of measurement scales for the variables. The variable names and corresponding items are detailed in Table 1.

Table 1. Measurement Scale for Variables

Vari-able	Item
PE	PE1: Live shopping is very useful. PE2: Live shopping can improve my shopping efficiency. PE3: When live shopping, I can find products that I like.
EE	EE1: Learning live shopping is easy. EE2: It is easy for me to use. EE3: Operating live shopping is easy.
SI	SI1: Important people in my life use live e-commerce shopping. SI2: They think I should try using live e-commerce shopping. SI3: I am more inclined to choose live rooms recommended by family or friends.
HM	HM1: I feel enjoyable while watching live broadcasts. HM2: Interacting with hosts and other viewers makes me feel comfortable. HM3: Using live shopping brings me a lot of fun.
HT	HT1: Compared to other methods, I prefer live shopping HT2: Using live shopping is a natural choice for me. HT3: When shopping, I always want to shop from companies that are live selling.
EC	EC1: The experience of using live shopping is better than what I originally expected. EC2: The experience of live shopping exceeds my expectations. EC3: My expectations for live shopping are mostly fulfilled.
SA	SA1: I think choosing to use live shopping is a wise decision. SA2: I am satisfied with the results of using live shopping. SA3: The experience of live shopping makes me feel pleasant.
CI	CI1: I don't have any aversion to using live shopping. CI2: I plan to continue using . CI3: In the future, I will use live shopping more frequently. CI4: I am willing to recommend using live shopping to friends.

2. Research Data

Between May 27th and June 10th, 2023, survey questionnaires were distributed to consumers who had experience shopping via live-stream e-commerce. The questionnaire was distributed online using the QuestionStar platform and promoted through social media channels such as WeChat, aiming to eliminate geographical limitations imposed by on-site surveys and ensure a broad research scope while enhancing the objectivity of the research results. A total of 347 questionnaires were collected during this period. After removing invalid samples, 312 valid questionnaires were obtained, resulting in an effective response rate of 90.0%. The descriptive statistics of the valid samples are shown in Table 2. Among the respondents, females accounted for a higher proportion at 66.0% while males accounted for 34.0%. In terms of age, young consumers between 18 and 35 years old represented the majority at 61.2%. Regarding education level, the majority held a college or bachelor's degree, accounting for 59.0%. The highest proportion of respondents had more than two years of experience in live-streaming shopping, reaching 39.7%. The composition of the questionnaire samples was reasonable and met the minimum requirements for structural equation modeling analysis, enabling the use of the data to validate the theoretical model.

Table 2. Descriptive Statistics of the Sample

Category		Qty	%
Gender	Male	106	34.0
	Female	206	66.0
Age	Below 18 years old	6	1.9
	18-24 years old	122	39.1
	25-34 years old	69	22.1
	35-44 years old	88	28.2
	45-54 years old	21	6.7
	55 years old and above	6	1.9
Edu.	Junior high school and below	4	1.3
	High school/ vocational school	16	5.1
	Associate's degree/ bachelor's degree	184	59.0
	Master's degree and above	108	34.6
Usage time	Within 6 months	60	19.2
	6 months to 1 year	59	18.9
	1 year to 2 years	69	22.1
	More than 2 years	124	39.7
Summary		312	100

V. Empirical Analysis

Following the approach proposed by Anderson et al. [40], the data analysis in this study consists of two parts. First, factor analysis is used to assess the reliability and validity of the data. Reliability will be measured using Cronbach's α coefficient, while validity will be measured using the Average Variance Extracted (AVE) and Construct Reliability (CR) values. In the second part, structural equation modeling will be employed to validate the hypothesized model, and Bootstrapping analysis will be used to examine the mediating effects.

1. Testing for Common Method Bias

The "Harman's single-factor test" and "Unmeasured Latent Method Factors (ULMC)" will be used to examine the presence of common method bias in the data [41]. Firstly, the Harman's single-factor test will be conducted to determine the unrotated maximum factor variance explained rate, which in this study accounts for 39.05% of the total variance, below the critical threshold of 40%. Then, the ULMC test will be performed by adding a common method bias factor to the baseline model and comparing the fit indices between the two models to assess whether there is a significant change. The results indicate no significant difference between the two models ($\Delta X2/\Delta df$ = 0.998, p = 1.000, ΔTLI = -0.05, ΔNFI = 0.001, ΔIFI = 0.001, ΔRFI = -0.004), suggesting no severe common method bias among the variables.

2. Reliability and Validity Analysis

SPSS 27.0 and AMOS 26.0 software will be used to examine the data's reliability and validity. The measurement results are presented in Tables 3 and 4. The Cronbach's α coefficients and Composite Reliability (CR) values of each variable are all above the minimum threshold of 0.70, indicating high reliability of the scales. The β values represent factor loadings, and in this study, the factor loadings for all items are greater than 0.7, and the AVE values are greater than 0.5, indicating good convergent validity of the measurement model. Furthermore, the square root of AVE for each latent variable is larger than the correlation coefficients between it and other latent variables, indicating good discriminant validity.

Table 3. Reliability and validity test of the scale

Item	SE	P	β	Cronbach'α	CR	AVE
PE1	0.057	0.000***	0.838	0.883	0.883	0.716
PE2	0.061	0.000***	0.864			
PE3			0.837			
EE1	0.069	0.000***	0.776	0.856	0.859	0.671
EE2	0.066	0.000***	0.847			
EE3			0.826			
SI1	0.076	0.000***	0.766	0.832	0.832	0.624
SI2	0.081	0.000***	0.833			
SI3			0.768			
HM1	0.061	0.000***	0.783	0.849	0.849	0.653
HM2	0.067	0.000***	0.819			
HM3			0.821			
HT1	0.053	0.000***	0.887	0.895	0.895	0.739
HT2	0.053	0.000***	0.842			
HT3			0.85			
EC1	0.068	0.000***	0.705	0.827	0.830	0.621
EC2	0.066	0.000***	0.823			
EC3			0.829			

***representsP<0.001,**representsP<0.01,*representsP<0.05

Table 4. Discriminatory validity test

	PE	EE	SI	HM	HT	EC
PE	0.846					
EE	0.518	0.819				
SI	0.685	0.428	0.790			
HM	0.665	0.455	0.714	0.808		
HT	0.783	0.481	0.748	0.721	0.860	
EC	0.696	0.386	0.723	0.702	0.781	0.788

Explanation : The bold text represents the square root of AVE, the others are Pearson correlation coefficients.

3. Model Fit Test

Model fit refers to the degree of consistency between the theoretical model and the actual data. The primary indicators include the value of $\chi2/df$, which should fall within the range of 1 to 3 to indicate a good fit. SRMR and RMSEA values below 0.08 indicate an acceptable fit, and values below 0.05 indicate a good fit. GFI, AGFI, NNFI, IFI, and CFI values greater than 0.9 indicate a good fit for the model. Table 5 shows that $\chi2/df$ = 1.288, which

falls within the range of 1 and 3. SRMR is less than 0.08, and RMSEA is less than 0.08. Additionally, GFI, AGFI, NNFI, IFI, and CFI values are all greater than 0.9, indicating a good fit between the data and the model.

Table 5. Model fit test

Fit index	Reference value	Test value
χ2		320.808
χ2/df	<3.0	1.288
RMSEA	<0.08	0.03
SRMR	<0.08	0.027
GFI	>0.9	0.924
AGFI	>0.9	0.901
NNFI	>0.9	0.946
IFI	>0.9	0.987
CFI	>0.9	0.987

4. Hypothesis Testing

The results of the path analysis are presented in Table 6 and Figure 2. The standardized path coefficients corresponding to H1, H2, H3, H4, H5, H6, H7, H8, H9, and H10 are 0.222, 0.19, 0.129, 0.083, 0.116, 0.843, 0.336, 0.133, 0.106, and 0.872, respectively. The p-values for all hypotheses are below 0.05, indicating that the hypotheses are supported. Based on the total effects of each variable on the intention to continue using, the influencing strengths are as follows: satisfaction > performance expectancy > effort expectancy > hedonic motivation > habit > social influence.

Table 6. Summary of hypotheses test results

	Unstd	SE	CR	P	Std.	Result
H1	0.137	0.028	4.866	0.000***	0.222	valid
H2	0.117	0.026	4.434	0.000***	0.19	valid
H3	0.07	0.023	3.097	0.002**	0.129	valid
H4	0.053	0.025	2.105	0.035*	0.083	valid
H5	0.056	0.019	3.033	0.002**	0.116	valid
H6	0.61	0.052	11.721	0.000***	0.843	valid
H7	0.286	0.037	7.731	0.000***	0.336	valid
H8	0.113	0.034	3.332	0.000***	0.133	valid
H9	0.079	0.03	2.646	0.008**	0.106	valid
H10	0.764	0.057	13.46	0.000***	0.872	valid

***representsP<0.001,**representsP<0.01,*representsP<0.05

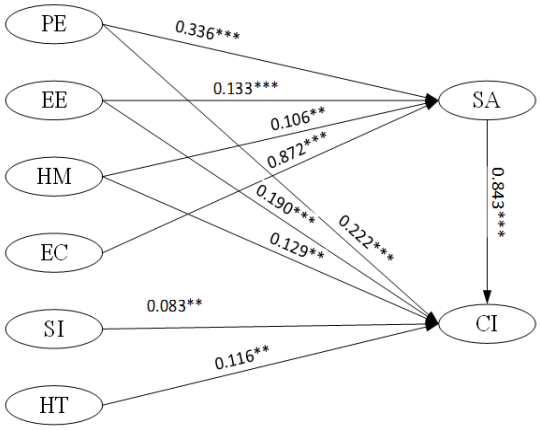

Fig. 2. SEM results for the model

5. Mediation Analysis

To further examine the mediation effect of satisfaction, the Bootstrapping analysis method was conducted using Amos 26.0 software. The number of bootstrap samples was set to 5000, and a 95% confidence interval was analyzed. The results are shown in Table 7. The four mediation paths are: performance expectancy → satisfaction → intention to continue using, effort expectancy → satisfaction → intention to continue using, hedonic motivation → satisfaction → intention to continue using, and expectation confirmation → satisfaction → intention to continue using. None of the confidence intervals for the mediation paths include 0, and the corresponding Z-values are greater than 1.96, indicating that satisfaction serves as a mediator in each of these paths.

Table 7. Results of mediating effect test

Path	Point Estimate	Product of Coefficients		Boot strapping	
		S.E	Z	lower	upper
PE→SA→CI	0.175	0.045	3.889	0.097	0.27
EE→SA→CI	0.069	0.033	2.091	0.000	0.145
HM→SA→CI	0.048	0.023	2.087	0.006	0.119
EC→SA→CI	0.466	0.055	8.473	0.366	0.581

VI. Conclusion and Implications

1. Research Conclusions

Drawing upon the UTAUT2 and ECM models, this study reveals the influencing mechanism of consumers' intention to continue using live-streaming e-commerce. The research conclusions are as follows:

First, the study confirms the significant positive effects of performance expectancy, effort expectancy, hedonic motivation, expectation confirmation, social influence, and habit on the intention to continue using. The path coefficients of the model indicate that performance expectancy is identified as the most influential factor affecting the intention to continue using, suggesting that consumers' expectations directly impact their willingness to continue using. Additionally, social influence and habit have relatively smaller effects on the intention to continue using in the model.

Second, satisfaction plays a significant mediating role in the relationships among performance expectancy, effort expectancy, hedonic motivation, expectation confirmation, and the intention to continue using. Among them, expectation confirmation is identified as the factor that most significantly influences satisfaction, validating the role of satisfaction as a mediator in the ECM model.

2. Practical Implications

First, provide superior services to improve user retention: Since performance expectancy is identified as a key factor influencing the intention to continue using, companies need to offer high-quality products and services, excellent user experiences, and competitive prices to meet consumer needs and expectations. These efforts will enhance users' stickiness to live-streaming e-commerce.

Second, emphasize on improving consumer shopping experiences to boost satisfaction: Satisfaction plays a significant role in influencing the intention to continue using, with expectation confirmation having an important impact on satisfaction. Therefore, companies should prioritize shopping experiences, enhance interaction with consumers, increase their sense of participation, and strengthen after-sales services to promptly address issues and feedback. These actions will increase consumers' expectation confirmation and, subsequently, promote their intention to continue using.

Third, improve usability, enhance entertainment value, and expand reach to enhance the attractiveness of live-streaming e-commerce: Effort expectancy, hedonic motivation, social influence, and habit all influence the intention to continue using. Thus, companies should optimize interface design and shopping processes to ensure easy purchasing operations. They can also introduce entertainment elements and interactive activities to make live-streaming shopping more enjoyable and spark consumers' interest. Furthermore, active marketing and promotion strategies should be employed to increase the visibility and exposure of live-streaming e-commerce. These measures will effectively enhance the attractiveness and influence of live-streaming, thereby fostering consumers' intention to continue purchasing.

3. Research Limitations and Future Directions

The survey primarily targeted young adults, and future research could consider diversifying the sample population. The dependent variable in this study is the intention to continue using, and actual usage behavior has not been explored. Future research could extend the scope of investigation. Additionally, consumer decision factors are influenced by individual characteristics, such as consumer psychology. In future research, it may be beneficial to employ multidimensional research models to deeply investigate the influencing mechanisms of consumer behavior in live-streaming e-commerce.

REFERENCES

[1] Xia, Y., Wang, X., Yu, J., & Zhao, C., "Live-streaming e-commerce: Management challenges and potential research directions," China Management Science, pp. 1-16, Mar. 2023. DOI: 10.16381/j.cnki.issn1003-207x.2021.1113.

[2] Liu,P.,&Shi,Y., "The influence mechanism of live-streaming marketing on consumer purchase decisions," China Retail Economics, vol. 34, no. 10, pp. 38-47, Oct. 2020. DOI: 10.14089/ j. cnki.cn11-3664/f.2020.10.004.

[3] "The role of live streaming in building consumer trust and engagement with social commerce sellers," Journal of Business Research, vol. 117, pp. 543-556, Sep. 2020, DOI: 10.1016/j.jbu sres.2018.08.032.

[4] Bhattacherjee, A., "Understanding Information Systems Continuance: An Expectation-Confirmation Model," MIS Quarterly, vol. 25, no. 3, p. 351, Sep. 2001, DOI: 10.2307/ 3250921.

[5] Shin, D. H., "Understanding purchasing behaviors in a virtual economy: Consumer behavior involving virtual currency in Web 2.0 communities," Interacting with Computers, vol. 20, no. 4-5, pp. 433-446, Sep. 2008, DOI: 10.1016/S0953- 5438(08)00025-8.

[6] Yan, A., & Yan, Y., "An empirical study of factors influencing the continued use intention of electronic resources in university libraries," Library Forum, vol. 33, no. 3, pp. 43-50, May 2013.

[7] Pan, L., Lin, B., Fang, M., & Chen, M., "Study on the continued use intention of tourism apps in the context of smart tourism," Tourism Tribune, vol. 31, no. 11, pp. 65-73, Nov. 2016, DOI: 10.3969/j.issn.1002-5006.2016.11.0012.

[8] Huang, B., & Zhu, X., "Research on the influencing factors of continuous usage intention of mobile social apps," Modern Information, vol. 42, no. 12, pp. 57-64, Dec. 2016, DOI: 10.3969/j.issn.1008-0821.2016.12.011.

[9] Li, Y., "Research on users' continuous usage intention and willingness to pay for online education platforms," Doctoral dissertation, University of Science and Technology of China, Sep. 2016.

[10] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D., "User Acceptance of Information Technology: Toward a Unified View," MIS Quarterly, vol. 27, no. 3, p. 425, Sep. 2003, DOI: 10.2307/30036540.

[11] Venkatesh, V., Thong, J. Y., & Xu, X., "Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology," MIS Quarterly, vol. 36, no. 1, p. 157, March 2012, DOI: 10.2307/ 41410412.

[12] Li, S., & Yuan, Q., "UTAUT and its application and prospects in information systems research," Modern Information, vol. 40, no. 10, pp. 168-177, Sep. 2020, DOI: 10.3969/j.issn. 1008-0821. 2020.10.018.

[13] San Martín, H., & Herrero, Á., "Influence of the user's psychological factors on the online purchase intention in rural tourism: Integrating innovativeness to the UTAUT framework," Tourism Management, vol. 33, no. 2, pp. 341-350, Apr. 2012, DOI: 10.1016/j.tourman. 2011.04.003.

[14] Rana, N. P., Dwivedi, Y. K., Williams, M. D., & Weerakkody, V., "Adoption of online public grievance redressal system in India: Toward developing a unified view," Computers in Human Behavior, vol. 59, pp. 265-282, Jun. 2016, DOI: 10.1016/ j.chb.2016.02.019.

[15] Shin, D.-H., "Towards an understanding of the consumer acceptance of mobile wallet," Computers in Human Behavior, vol. 25, no. 6, pp. 1343-1354, Nov. 2009, DOI: 10.1016/j.chb. 2009.06.001.

[16] Abu-Al-Aish, A., & Love, S., "Factors Influencing Students' Acceptance of M-Learning: An Investigation in Higher Education," International Review of Research in Open and Distributed Learning, vol. 14, no. 5, pp. 82-107, Dec. 2013, DOI: 10.19173/irrodl.v14i5.1631.

[17] Oliver, R. L., "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions," Journal of Marketing Research, vol. 17, no. 4, pp. 460-469, Nov. 1980, DOI: 10. 1177/002224378001700405.

[18] Wang, M., "Research on the influencing factors of video website user stickiness based on ECT theory and FLOW theory: A case study of Bilibili," Theory and Practice, vol. 7, no. 1, pp. 80-92, Jan. 2021, DOI: 10.3772/j.issn.2095- 915x.2021.01.007.

[19] Deng, W., & Yu, G., "Influencing factors of consumers' continuous use of community group buying," Journal of South-Central University for Nationalities, vol. 42, no. 12, pp. 144-152, Nov. 2022, DOI: 10.19898/j.cnki.42-1704/C. 20221121.01.

[20] Wu, X., & Zhang, D., "Research on academic users' continuous usage intention of mobile visual search: An empirical analysis based on UTAUT2-ECT integrated model," Journal of Information, Aug. 2023, DOI: 10.3969 /j.issn.1002 - 1965.2023. 08.025

[21] Yang, F., & Zhang, Z., "Modeling and empirical study on the influencing factors of e-book users' intention to use," Library and Information Service, vol. 64, no. 9, pp. 85-94, Sep. 2020, DOI: 10.13266/j.issn.0252-3116.2020.09.010.

[22] Davis, F. D., "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," MIS Quarterly, vol. 13, no. 3, p. 319, Sep. 1989, DOI: 10.2307/ 249008.

[23] Thompson, R. L., Higgins, C. A., & Howell, J. M., "Personal Computing: Toward a Conceptual Model of Utilization," MIS Quarterly, vol. 15, no. 1, p. 125, Mar. 1991, DOI: 10.2307/24 9443.

[24] Cui, Z., Cui, H., & Yuan, X., "Research on the antecedent mechanism of sustained and stable development of sharing

economy: A case study of life service-sharing economy," Economic Issues, no. 2, pp. 59-68, Feb. 2022, DOI: 10.16011/ j.cnki. jjwt. 2022.02.008.

[25] El-Masri, M., & Tarhini, A., "Erratum to: Factors affecting the adoption of e-learning systems in Qatar and USA: Extending the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)," Educational Technology Research and Development, vol. 65, no. 3, pp. 765-767, Jun. 2017, DOI: 10.10 07/s11423-017-9526-1.

[26] Yuan, S., Ma, W., Kanthawala, S., & Peng, W., "Keep Using My Health Apps: Discover Users' Perception of Health and Fitness Apps with the UTAUT2 Model," Telemedicine and e-Health, vol. 21, no. 9, pp. 735-741, Sep. 2015, DOI: 10.1089/ tmj.2014.0148.

[27] Alalwan, A. A., "Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse," International Journal of Information Management, vol. 50, pp. 28-44, Feb. 2020, DOI: 10.1016/j.ij infomgt.2019.04.008.

[28] Zeng, J., "Study on the acceptance of mobile language learning users based on the UTAUT2 model," Foreign Language Electronic Teaching, no. 190, pp. 16-24, Dec. 2019.

[29] Verplanken, B., & Orbell, S., "Reflections on Past Behavior: A Self-Report Index of Habit Strength," Journal of Applied Social Psychology, vol. 33, no. 6, pp. 1313-1330, Jun. 2003, DOI: 10.1111/j.1559-1816.2003.tb01951.x.

[30] Gefen, D., Karahanna, E., & Straub, D. W., "Trust and TAM in Online Shopping: An Integrated Model," MIS Quarterly, vol. 27, no. 1, p. 51, Mar. 2003, DOI: 10.2307/30036519.

[31] Zhang, M., Long, B., Liu, Y., & Zhang, Y., "Exploring the influencing factors of sustained use of short video apps and their implications for public governance in this field," Modern Information, vol. 40, no. 3, pp. 65-73, Feb.2020.

[32] Liu, Z., "Research on the influencing factors of continuous intention to use mobile shopping in the B2C environment: Based on the expectation-confirmation model," Business and Economics Research, no. 17, pp. 49-52, Aug. 2017.

[33] Wang, W., & Liu, Y., "An empirical study on consumers' continuous use of emerging online travel websites: The mediating role of customer satisfaction and trust," Journal of Jinan University (Philosophy and Social Sciences Edition), vol. 36, no. 4, pp. 84-92, Apr. 2014.

[34] Shin, D.-H., Shin, Y.-J., Choo, H., & Beom, K., "Smartphones as smart pedagogical tools: Implications for smartphones as u-learning devices," Computers in Human Behavior, vol. 27, no. 6, pp. 2207-2214, Nov. 2011, DOI: 10.1016/j.chb.2011.06.017.

[35] He, D., & Lu, Y., "An empirical analysis of rural residents' acceptance of mobile information services," China Rural Economy, no.1, pp. 70-81, Jan. 2009.

[36] He, H., & Zhang, R., "Analysis and research on influencing factors of internet medical patient satisfaction," Packaging Engineering, vol. 42, no. 22, pp. 204-211, Dec. 2021, DOI: 10.19554/j.cnki.1001-3563.2021.22.026.

[37] Davis, F. D., "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," MIS Quarterly, vol. 13, no. 3, p. 319, Sep. 1989, DOI: 10.2307/ 249008.

[38] Taylor, S., & Todd, P. A., "Understanding information technology usage: A test of competing models," Information Systems Research, Jun. 1995, 6(2), 144-176.

[39] Lee, M.-C., "Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model," Computers & Education, vol. 54, no. 2, pp. 506-516, Feb. 2010, DOI: 10.1016/j.compedu. 2009.09.002.

[40] Anderson, J. C., & Gerbing, D. W., "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," Psychological Bulletin, vol. 103, no. 3, p. 411, Jun. 1988, DOI: 10.1037/0033-2909.103.3.411.

[41] Tang, D., & Wen, Z., "Common method bias test: Issues and suggestions," Psychological Science, vol. 43, no. 1, pp. 215-223, Jan. 2020, DOI: 10.16719/j.cnki.1671-6981. 20200130.

[42] Chaiyasoonthorn, W., & Suksa-ngiam, W., "Users' Acceptance of Online Literature Databases in a Thai University: A Test of UTAUT2," International Journal of Information Systems and Service Sector (IJISSS), vol. 10, no. 1, pp. 54-70, Jan. 2018, DOI: 10.4018/IJISSS.20180 10104.

[43] Shim, S., Eastlick, M. A., Lotz, S. L., & Warrington, P., "An online prepurchase intentions model: The role of intention to search," Journal of Retailing, May 2001, DOI: 10.1016/S0022-4359 (01) 00051-3.

[44] Chang, Y., "Research on the influence of live broadcasting of agricultural products on consumers' purchasing intention: An analysis based on the transmission effect of perceived value and perceived risk," Price Theory and Practice, issue 7, pp. 1-4, Jul. 2022, DOI: 10.19851/j.cnki.CN11-1010/ F.2022. 07.493.

[45] Yang, G., "Research on the influencing factors of MOOC users' continuous use behavior," Open Education Research, vol. 22, no. 1, pp. 100-111, Jan. 2016, DOI: 10.13966/j.cnki.kfjyyj.2016.01. 012.

[46] Fan, Z., "Analysis of the influence of perceived usefulness and ease of use on users' intention to use mobile visual search behavior," Library and Information Service, vol. 41, no. 1, pp. 79-86, Jul. 2020, DOI: 10.19851/j.cnki.CN11-1010/F.2022.07. 493.

Authors

Yongfeng Hu received his B.s. degree in Computer Science in 2004 and his M.s. degree in Business Administration in 2011, both from Hebei University of Technology, China.He is currently a Ph.D. candidate in Kyonggi University. He is interested in Global Business and E-Business.

Chi Gong graduated from Seoul National University in 2012 and has worked at Seoul National University and Sichuan University. Since 2021, he has been employed at Kyonggi University.

Professor Gong focuses on international finance and econometrics. He has published multiple papers in economics journals.