# An Exhaustive Likelihood Model of Consumer Purchase Intention to Live Streaming : Flow and Satisfaction as Moderators

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Abstract. The Elaboration Likelihood Model is adopted in this study to examine the interaction of central route factors (product quality, price concessions and return shipping insurance) and peripheral route factors (anchor attractiveness and interactivity) on consumer purchase intention to live streaming. Flow and satisfaction served as moderators affecting the relationship between consumer purchase intention. 319 valid questionnaires in all were gathered. The study of the data revealed that, via satisfaction, consumers' purchase intentions in the central route were significantly positively impacted by product quality, price reductions, and return shipping insurance; while in the peripheral route, flow and satisfaction, two parallel mediating variables, had a strong positive impact on purchase intention through the anchor attractiveness and interactivity. The results of this study can provide some insight into how businesses create their marketing plans.

Keywords: live e-commerce; ELM; use and satisfaction theory; purchase intention

# 1 Introduction

The current live shopping has become a revenue grabber for enterprises. China has 751 million live webcast users as of December 2022, up 47.28 million from December 2021, making up 70.3% of all Internet users in the country, according to the 51st Statistical Report on the Development of China's Internet<sup>[1]</sup>. In the context of deep collaboration between webcasting and various industries, it is beneficial for e-commerce platforms and merchants to make timely adjustments to merchandise marketing by exploring the elements influencing shoppers' intent to buy in live streaming e-commerce. Currently, the effects of live streaming situations and information source characteristics on internet customers' consumption behavior have been studied in some research, but products are the factors that consumers must consider when making purchase decisions. Therefore, in addition to studying the influence of "people" and "field", scholars should also pay attention to the influence of "goods" on consumers' purchase intention in e-commerce live streaming <sup>[2-5]</sup>. The Exhaustive Likelihood Model (ELM), proposed by social psychologists Petty and Cacioppo, argues that the depth of information processing is driven by one's own motivation and needs, and has been applied to explain how people process information and change their attitudes toward it <sup>[6-8]</sup>.

Flow is a concept introduced by psychologist Csikszentmihalyi, which is "an immersive mental state that effortlessly focuses the brain's attention on what is being done, losing self-awareness

and changes in the sense of time <sup>[9-10]</sup>. A series of studies have been conducted on its use in different domains such as online environments, which have confirmed the positive role of mindflow experience in the usage behavior of live streaming users <sup>[11]</sup>. In addition, drawing on use and satisfaction theory, <sup>[12]</sup> (Users use media as a process of seeking "satisfaction" of psychological and social needs) to analyze the central route and explore the route by which consumers form their willingness to purchase due to different needs (including entertainment satisfaction, social satisfaction, and utilitarian satisfaction) being met while watching live e-commerce streams.

Based on the e-commerce live-streaming scenario, there are fewer studies that incorporate anchor attractiveness with interactivity and product-related factors in the same research framework for cross-fertilization. Therefore, the ELM is used to explore the effects of different types of information cues on consumers' purchase intentions, and to reveal the mechanism of the role of flow and satisfaction between antecedent variables and consumers' purchase intentions, providing some theoretical references for e-commerce live streaming research.

# 2 Theoretical basis and research hypothesis

# 2.1 Exhaustive likelihood model

The ELM, also known as the dual routes, has been widely used in various fields involving information processing since its inception. In the field of business economics, the ELM can be used as a persuasive model to explain how different decision categories affect consumers' attitudes and purchase intentions, and as a tool to help management better understand the route of information to users in order to develop effective marketing strategies [13-14].

The ELM includes central route and peripheral route. Individuals who process information through the central route tend to view information rationally, scrutinize relevant information, and change their attitudes in a logical manner, and the route deals mainly with information that is directly related to the task or characterized by specific attributes of the product; therefore, the central route can be considered to achieve persuasion by disseminating rational information such as product quality and price. On the other hand, those who pass through the peripheral route think and deliberate less about the information and are influenced only by simple cues outside the individual<sup>[15]</sup>. In conclusion, the degree of depth of information processing by consumers is determined by their own motivation and needs.

The central route and the peripheral route differ from one another in three ways, according to Bhattacherjee et al. The two paths were first employed to examine how people digest various kinds of information. Second, those that choose the central path do so at a greater cost in terms of both time and effort. Third, the central route's influence is more consistent than the periphery route's <sup>[7]</sup>·According to Martina et al., the center route has a stronger impact on trust-building than other routes, despite the fact that both are crucial for affecting changes in consumer views<sup>[16]</sup>.

This study explores the impact of e-commerce live streaming on consumers' purchase intention using the ELM to explore how specific variables under the two route ultimately affect consumers' purchase intention. Through literature combing, the representative variables of the central

route are selected as product quality, price preferability and return shipping insurance; the representative variables of the peripheral route are selected as anchor attractiveness and anchor interactivity. Flow and satisfaction are also adopted moderators to examine the moderating effect on consumers' willingness to buy.

# 2.2 Research hypothesis

# 2.2.1 Central route proxy variables and purchase intentions.

### (1) The influence of product quality on purchase intention.

When consumers make a purchase, the quality of the product is one of the factors they are most concerned about. The appearance, function, and qualities of the goods displayed in the live broadcast are the biggest concerns of consumers, who enter the live broadcast due to product consumption needs, and whether the product quality meets the consumers' requirements will have a greater impact on the purchase intention [17]. Accordingly, hypothesis 1 is proposed in this paper.

H1:Product quality significantly and positively affects consumers' willingness to purchase.

#### (2) The effect of price concessionality on purchase intention.

Price is also one of the most important factors for consumers to carry out their purchase behavior. Studies have found that price concessionality can positively influence consumers' purchase behavior [18-20]. Live-streams attract consumers to stop by with low prices, and by comparing the price information of each live-stream, consumers carefully screen the cost-effective live-streams and strive to buy the most satisfying products at the best price [21]. Accordingly, hypothesis 2 is proposed in this paper.

H2:Price concessionality significantly and positively affects consumers' purchase intention.

#### (3) The impact of return shipping insurance on purchase intention.

Consumers face information asymmetry when watching live banding, and return shipping insurance reduces consumer concerns and protects their rights. As a result, consumers often consider whether a merchant is giving away shipping insurance when making a purchase. The return shipping insurance stimulates consumers' hidden demand and has a certain promotion effect on purchase intention. Accordingly, hypothesis 3 is proposed in this paper.

H3:Return shipping insurance significantly and positively affects consumers' purchase intention.

### 2.2.2 Effect of peripheral route proxy variables on purchase intention.

# (1) The effect of anchor attractiveness on purchase intention.

Anchor attractiveness is reflected by the external image as perceived by the general consumers <sup>[22]</sup>. When anchors are highly attractive, they increase consumers' attention to products and brands, stimulate their curiosity and desire to explore the products, and thus stimulate their purchase intentions <sup>[23]</sup>. Park et al. showed that the attractiveness of weblebrities enhances the effectiveness of their endorsements, which promotes consumers' purchase of their products <sup>[24]</sup>. Therefore, in the context of live e-commerce, the attractiveness of the lead anchor positively influences consumers' purchase intention. Accordingly, hypothesis 4 is proposed in this paper.

H4:Anchor attractiveness significantly and positively affects consumers' purchase intentions.

#### (2) The influence of anchor interactivity on purchase intention.

The interactivity of the anchor is mainly reflected in the communication and interaction between the anchor and the consumer in the live broadcast environment, including answering questions about the product and explaining product-related information to the consumer, thus increasing the consumer's understanding of the product, and the anchor interactivity also increases the consumer's participation. By studying virtual anchors, Cui-Cui Wang et al. found that interactivity further influences purchase intention by affecting social presence<sup>[25]</sup>. Accordingly, hypothesis 5 is proposed in this paper.

H5:Anchor interactivity significantly and positively affects consumers' purchase intention.

#### 2.3 Moderator- satisfaction

Use and satisfaction theory suggests that individuals seek satisfaction from the medium based on their specific need motivations [26]. Thus, the promotion of consumers' purchase intentions in the live e-commerce scenario, both central and edge routes, may be achieved through the satisfaction of different types of consumer needs. Specifically, product quality is one of the key factors that consumers consider when purchasing a product. The better the product quality is, the more it can satisfy consumers' practical needs, which in turn promotes consumers' purchase intention. Price concessionality is the price discount that consumers receive when shopping in the live room, and the stronger the price discount, the more it can meet consumers' utilitarian needs, which in turn promotes the willingness to buy. Return shipping insurance solves consumers' worries about returns and exchanges due to product differences, protects consumers' rights and interests, satisfies consumers' utilitarian needs, and thus promotes purchase intentions. Anchor appeal satisfies consumers' entertainment needs, which in turn promotes purchase intentions. Some studies have found that image management by companies through online interactions positively affects consumer perceptions, transactions, and purchase intentions [27]. Therefore, anchors satisfy consumers' social needs through frequent interactions with them, which in turn promotes purchase intention. Accordingly, this paper proposes hypothesis 6 and hypothesis

H6:Satisfaction significantly and positively affects consumers' purchase intention.

H7:Satisfaction mediates between product quality, price concessionality, return shipping insurance, anchor attractiveness, anchor interactivity and purchase intention, respectively.

#### 2.4 Moderator- flow

Studies have shown that flow positively influences consumers' purchase intentions, and the higher the flow experience, the more likely consumers are to make repeat and impulse purchases [28-29]. Anchors can use their strong appeal to make consumers stay in the live room for a long time and increase their attention to the product, which leads to purchase intention. Frequent interactions between e-commerce anchors and online consumers can cause consumers to generate flow, which in turn can lead to purchases. The anchor's use of live-streaming to distribute lucky bags and other activities to increase consumer engagement can immerse consumers and increase their recognition of the live-streamed product, thus contributing to purchase intentions. Accordingly, hypothesis 7 and hypothesis 8 are proposed in this paper.

H8:Flow significantly and positively affects consumers' purchase intention.

H9:Flow plays a mediating role between anchor attractiveness, anchor interactivity and consumer purchase intention, respectively.

In summary, the proposed research model is shown in Figure 1:

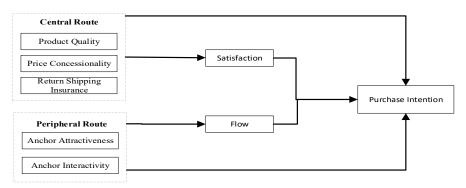


Figure 1 Research model

# 3 Questionnaire design and data collection

# 3.1 Scale design

This paper's questionnaire design is divided into two sections. The respondents' basic information, such as gender, age, highest education, occupation, etc., is shown in the first section. The examination of factors influencing consumers' purchase intentions in the setting of live ecommerce is covered in the second section. The measure uses the Likert five-point scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," and draws on established scales from both domestic and international sources. Product quality (PQ) refers to Wang Quzhen et al.'s scale and adjusts it with the live streaming context [30]; price concessionality (PC) refers to Faryabi et al.'s [19] scale; return shipping insurance (RSI) refers to Wang et al.'s [31] scale combined with the characteristics of live e-commerce; anchor attractiveness (AA) refers to YUAN et al.'s [32] scale; anchor interactivity (AI) refers to Flanagin's [33] scale; flow (FL) uses the classical scale proposed by Novak [34]; satisfaction (SA) uses the mature scale of Li [35] et al. and Chen [36] et al.; purchase intention (PI) refers to Sun et al.'s [37] scale.

# 3.2 Data collection and sample description

In this study, the questionnaire release data collection stage was firstly pre-surveyed to check the applicability of the questionnaire, and then questionnaire research was conducted through the questionnaire star platform for the group with live shopping experience. A total of 330 questionnaires were gathered throughout the 11-day data collecting period starting on 2023.5.8, and 319 valid questionnaires were remaining after invalid questionnaires were removed. Among all respondents, 59.87% are female and 40.13% were male; the age of respondents are mainly aged 18-24 and 25-34, accounting for 34.8% and 27.9%; the education level of respondents is mainly college, bachelor and master or above, accounting for 33.23%, 26.02% and 30.72% respectively; the occupation of respondents is mainly company employees and school students, accounting

for 30.41% and 31.97% respectively; the monthly consumption level of online shopping is mainly concentrated in the range of RMB 500-1500, accounting for 67.68%. The analysisdemonstrates that the sample is representative of demographic characteristics.

# 4 Data Analysis

#### 4.1 Scale reliability and validity analysis

The reliability of the scale was tested in this study using SPSS 26.0, and the results showed that the scale had good reliability and internal consistency with a Cronbach's alpha of 0.981. The KMO value was 0.982, which was more than 0.5 and passed Bartlett's spherical significance test, therefore it passed both the KMO and Bartlett's tests. The minimum value of the standardized factor loadings for each measurement question under each variable was greater than the threshold value of 0.5, the combined reliability coefficient CR values were all greater than 0.7, the AVE values were all greater than 0.5, and this showed that the variables had good convergent validity. The square root of the average variance extracted value (AVE), which is greater than the correlation coefficient among the variables, is a sign of strong discriminant validity between the variables. The scale may be used for this investigation since it has great reliability and validity.

# 4.2 Model hypothesis testing

Through the above reliability analysis of the questionnaire scale, this study conducted a path analysis of the hypotheses, and the outcomes demonstrated that study model fitted the data well. According to the findings, the central route, product quality, price concessionality and return shipping insurance significantly and positively affect purchase intention (H1, H2 and H3). When consumers are in the central route, the need and motivation to obtain information is greater, and consumers will actively search for information and think rationally about relevant information of the product. The high product quality, low price and return shipping insurance service all reduce the difficulty of processing information to a certain extent, it thus has a favorable effect on consumers' purchase intention. Under the peripheral route, anchor attractiveness and interactivity significantly and positively affect online consumers' purchase intention (H4 and H5). Under the peripheral route, consumers have less need and motivation to process information, and customers do not want to invest a lot of time and energy on pay attention to relevant information. The good attractiveness and positive interaction process of the anchor improves consumers' familiarity with the product, reduces the difficulty of processing information, and promotes consumers' purchasing behavior. When consumers are immersed in live shopping, a forgetful flow experience occurs, and in this state consumers have less self-control and are more likely to make purchases (H6). When consumers get some kind of satisfaction from live shopping, their shopping decisions are more likely to be simplified and so engage in purchasing behavior (H9). Table 1 and Figure 2 display the full results.

Table 1 Research hypothesis testing results

Hypothetical	Route Relationships	Beta	S.E.	P-Value	Test Results
H1	PQ→PI	0.779	0.036	0.000***	Established
H2	PC→PI	0.766	0.035	0.000***	Established

Н3	RSI→PI	0.677	0.042	0.000***	Established	
H4	$AA \rightarrow PI$	0.836	0.032	0.000***	Established	
H5	AI→PI	0.819	0.030	0.000***	Established	
Н6	SA→PI	0.860	0.030	0.000***	Established	
H8	FL→PI	0.841	0.030	0.000***	Established	

Note: \*\*\*, \*\*, \* represent 1%, 5%, 10% significance levels, respectively.

S.E. indicates standard error.

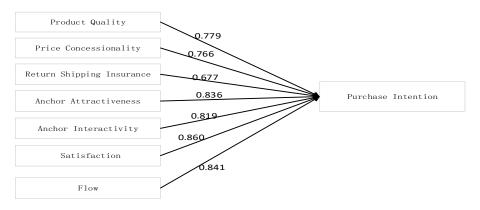


Figure 2 Model route diagram

### 4.3 Intermediation effect test

The mediation effect of flow and satisfaction was tested using the process program of SPSS 26.0, controlling for the variables of gender, age, education, occupation, and monthly consumption level of online shopping. In order to avoid the effect of cointegration between independent variables on the mediating effect test, therefore, the mediating effect test was conducted separately for each independent variable. The number of Bootstrap replicate samples is 5,000, and the confidence interval is 95%. When the test interval does not contain 0, the mediating effect exists; when the test interval contains 0, the mediating effect does not exist. In the paths of product quality, price concessions, return shipping insurance, interactivity and attractiveness respectively mediated by satisfaction on purchase intention, the confidence intervals for the mediating effect test are (0.393, 0.574), (0.391, 0.535), (0.407, 0.566), (0.328, 0.547) and (0.306, 0.496), respectively. The confidence interval for the mediation effect did not contain 0, indicating that the mediation effect played by satisfaction between product quality, price preferability, return shipping insurance, interactivity, attractiveness and purchase intention, respectively, was significant, i.e., hypothesis 7 was tested. In the path of attractiveness and interactivity as mediated by flow on purchase intention, respectively, the confidence intervals of the mediation effect test were (0.285, 0.505) and (0.302, 0.491), respectively, and the confidence intervals did not contain 0, indicating that flow played a significant mediation effect between attractiveness, interactivity and purchase intention, respectively, i.e., hypothesis 8 was verified. Table 2 display the full results.

Table 2 Intermediary study hypothesis testing results

Hypothetical	Route _ Relationships	Bootstrap Test Results		95% Confidence Interval		
		Effect Value	Standard Error	Lower limit	Upper limit	Text Results
	PQ→SA→PI	0.482	0.046	0.393	0.574	Established
Н7	$PC \rightarrow SA \rightarrow PI$	0.459	0.036	0.391	0.535	Established
	$RSI{\rightarrow}SA{\rightarrow}PI$	0.484	0.04	0.407	0.566	Established
	$AA \rightarrow SA \rightarrow PI$	0.439	0.057	0.328	0.547	Established
	$AI \rightarrow SA \rightarrow PI$	0.4	0.05	0.306	0.496	Established
Н8	AA→FL→PI	0.398	0.055	0.285	0.505	Established
	$AI \rightarrow FL \rightarrow PI$	0.391	0.048	0.302	0.491	Established

# 5 Research conclusions and recommendations

#### 5.1 Research conclusions

(1)Under the central route, product quality, price concessionality, and return shipping insurance all significantly and positively affect consumers' purchase intentions.

Product quality ,price and return shipping insurance are important influencing factors for consumers to make purchase decisions, therefore, they become factors that merchants must focus on. Merchants can only improve product quality and develop reasonable and attractive price incentives in order to increase live traffic and improve purchase rates.

(2) Under the peripheral route, the attractiveness and interactivity of anchors significantly and positively affect consumers' purchase intention.

Since consumers' motivation to process information is relatively weak in the peripheral route, the interaction between anchors and consumers makes consumers' knowledge of products more dependent on anchors. Therefore, the attractiveness and interactivity of the anchor will significantly promote online consumers' purchase intention.

(3) Flow and satisfaction are the intrinsic mechanisms to increase consumers' purchase intention.

The interactivity and attractiveness of the anchor is to make the consumers watching the live broadcast feel satisfied and thus influence their purchase intention; the product quality, price concessions, and return shipping insurance are to make the consumers feel satisfied and thus promote their purchase intention. In the context of live e-commerce, better product quality, lower price and return shipping insurance meet the utilitarian needs of consumers, and consumers are more likely to make purchase decisions. At the same time, in this fast-paced era, sensory experience is also the ultimate pursuit of consumers. The anchor serves as a link between the product and the consumer, connecting with the consumer through attractiveness and interactivity. In this process, consumers' sense of pleasure is awakened and immersed, while consumers' entertainment needs are satisfied, further enhancing their willingness to purchase.

# 5.2 Recommendations

Under the central route, online consumers are more motivated to buy products and have a higher demand for "satisfaction". Merchants should provide high quality products to satisfy consumers' utilitarian needs, set low prices to attract consumers, and play an active role in competing with other homogeneous live broadcasters. At the same time merchants provide return shipping insurance is invisible to promote consumer willingness to buy, return shipping insurance will stimulate the invisible needs of online consumers and reduce the worry.

Under the peripheral route, anchors can make online consumers generate flow by virtue of their attractiveness and interactivity, lead them to generate interest in products, discover their hidden needs, and prompt them to generate purchase intentions. In other words, anchors can gradually guide consumers who have passed the peripheral route to the central route, thus making their willingness to buy more durable and stable. The anchors should actively interact with each other to simplify the difficulty of processing information for consumers and improve the efficiency of shopping and the initiative of processing product information. Therefore, when choosing the anchor with goods, businesses should choose the anchor with more attractive and interactive qualities. And when choosing anchors, they should also match with the product category. A high degree of fit between the anchor's traits and the product category will increase consumers' trust in the live broadcast and prolong the time they stay in the live broadcast.

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