

# The Impact of E-commerce Live Streaming on University Students' Impulsive Purchasing Behavior

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**Abstract:** With the rapid development of e-commerce live streaming after the epidemic, university student groups who often watch live streaming sometimes lead to irrational consumption behavior. Many factors are leading to such consumption that are worth discussing. For merchants, how to use these factors to increase sales of live-streamed products has become an issue. For university students, circumventing the influence of rational consumption is also an essential topic for growth. Therefore, whether these four factors lead to consumers' purchase intentions and thus influence straight irrational consumption behavior is the topic that this paper focuses on verifying. This study is based on the S-O-D model and the questionnaire method. The factors affecting users' willingness to consume in e-commerce live streaming are sorted into four types: price attraction, interactivity, environmental immersion, and impulsive trait, combined with the production questionnaire data, the establishment of regression models, verification to derive the impact factors that make university students impulsive consumption in e-commerce live streaming. The results show that interactivity, environmental immersion, and impulsive trait significantly influence the irrational consumption behavior of university students. However, the price factor, which most scholars consider, is not the most important influencing factor and even presents a more negligible correlation. Therefore, apart from the personal motivation of the users, interactivity and environment immersion should be taken seriously.

## 1. Introduction

### 1.1 Research Background

The success of online video-sharing platforms has been phenomenal. According to Cisco's annual Visual Network Index (VNI) forecast, video accounts for an overwhelming share of total Internet traffic [1]. With this shift to the mobile Internet, the video-sharing industry has been reshaped in recent years. One of the biggest trends is the emergence of short-form video platforms. Douyin, the original Chinese original version of TikTok, is an online short video mobile application that Byte Dance launched in September 2016. According to their official introduction, "Douyin is a short video platform that helps users express themselves and record a good life" [2]. Monitoring data from Bigdata-Research in June showed that the number of active Douyin users was 697.928 million, ranking first in the industry [3].

However, with the development of internet service and mobile devices, customers' purchasing behavior changes dramatically from visiting offline stores to online shopping. Customer behavior is a well-studied research area in marketing literature. Different factors of sociology affect the customer's purchasing behavior. Due to the convenience of the network, many people have experienced impulsive purchasing behavior that happens when they browse websites and maybe regret buying. Impulse buying is a sudden, compelling, hedonically complex purchase behavior in

which the rapidity of the impulse purchase decision precludes any thoughtful, deliberate consideration of alternatives or future implications [4].

## **1.2 Research Object**

Based on the influence of internet short-form video sharing on consumers, the paper will consider factors brought about by the epidemic. Short-form video advertising causes psychological repulsion of audiences, which carries two opposite influences to consumers. Consumers might be interested in short-form video advertising and then click into the live streaming and purchase. Nevertheless, they probably can produce psychological resistance and reduce brand goodwill degrees due to privacy issues. At the same time, other research shows that the outbreak has influenced the consumption level and consumer preference [5]. The primary cause is safety and requirements, logistics and the problem of the price level, and long-term outbreak deeply for a long time, Jiang Kun from the restaurant operator's corner [5].

## **1.3 Research Hypothesis**

The most crucial part of online celebrity live streaming is enormous audiences, especially the young generation. The scope of influence of e-commerce live streaming is also extensive. The psychology of the audience and the content that streamers are mutually influenced. The audience's psychology determines the content and form that streamers promote. These contents and documents react to the audience, causing positive or negative effects on the audience and affecting the audience's consumption behavior. Pi Haibing believes that although the audience can get entertainment from the streamer and get a moment's pleasure from the purchase behavior in the live streaming, the audience will inevitably have irrational consumption behavior when they are "recommended products" [6].

### **1.3.1 Price Factors**

Various e-commerce live streaming will use coupons, gifts, discounts, flash sales, and other preferential activities to make the price of goods lower than usual ones. Such price drop changes make consumers have purchase intention. After the publicity and description of streamers, it is easy to stimulate consumers' impulse consumption psychology, resulting in irrational consumption behavior. Therefore, the hypothesis is as follows: H1: The attraction of commodity prices positively impacts the impulsive consumption behavior of consumers.

### **1.3.2 Interactive Attraction Factors**

Liu, Li, and Yin put forward that online shopping platforms can quickly respond to consumers' information needs through live streaming of Internet celebrities [7]. Good interaction and communication can make consumers arouse positive emotions. Customers can freely choose browsing content and information display methods. The timely response of merchants to the problems raised by consumers and the communication and information exchange between consumers will stimulate the emotional reaction of shoppers.

Internet celebrity streamers will design their images according to the preferences of consumers and the different attributes of consumer groups and products to produce visual stimulation to consumers and influence their behaviors. Therefore, the following hypothesis:

H2: The interactivity of e-commerce live streaming positively impacts consumers' impulsive consumption behavior.

### **1.3.3 Environment Immersion Factors**

Scenario Applications provide personalized and timely services based on user requirements in different situations. Live streaming is very successful in creating an immersive environment. According to the SOR model, an immersive environment will significantly influence users watching live streaming and interfere with their psychology, resulting in irrational consumer behaviors. The following hypothesis is:

H3: Environment Immersion positively impacts consumers' impulsive consumption behavior.

### **1.3.4 Impulsive Trait**

Under the epidemic situation, university students feel depressed due to the changes in their studying environment and other social factors. Watching live streaming is an information window for them, and consumption is also an emotional catharsis. Therefore, the following hypothesis is:

H4: Users produce impulsive consumption behavior for catharsis purposes.

### **1.4 Importance of Research Question**

Under the effect of Covid-19, ways of advertising and purchasing changed dramatically. The prosperity of e-commerce live streaming makes the marketing environment renewed.

Research needs to follow the world's steps. It is of great significance to study how the characteristics of live streaming goods affect consumers' purchasing behavior.

## **2. LITERATURE REVIEW**

### **2.1 Impulsive Purchasing Behavior**

Impulse buying is a significant research issue among consumer behavior researchers because of its complexities and widespread prevalence across a broad range of product categories. Some scholars believe impulsive purchasing behavior is associated with self-resilience. Lehmann and others researched factors that influence impulsive purchasing and found that it occurs when individuals lack self-control over what they buy [8]. Roberts and Manolis also thought consumers who do not create an effective strategy to develop resistance to impulsive buying would tend to fall into temptation [9]. Xu and Xiao analyzed the reasons why university students in China watched live streaming [10]. They found that live streaming shopping is driven by commodity price, price-performance ratio, and discount intensity [10]. It could be seen that spiritual satisfaction was a fundamental reason for watching live streaming, but the material factor is still an essential factor leading to their actual consumption [10].

### **2.2 Social Media Advertising**

Due to the increased usage of information and communication technologies (ICTs), social media has penetrated society and become an integrated part of everyone's lives. On social media sites, advertisers can get a direct reaction from the customers in their response. Gelper et al. investigated the social media advertisements for movies and concluded that consumers generate online evaluations automatically [11].

This information encourages the advertisers to advertise more and makes necessary changes according to the target people's reactions. Kaplan and Haenlein defined social media as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and allow the creation and exchange of user-generated content [12]. As social media penetrates the daily routine of everyone, not only the scholars put a great emphasis on the topic, but also practitioners take advantage of numerous opportunities of social media. Their study categorized social media into six groups: collaborative projects, blogs and microblogs, content communities, social networking sites, virtual game worlds, and virtual social worlds.

Furthermore, Social media advertisements are estimated as 16% of total digital ad spending, but this figure is growing fast because social media is expanding with great speed [13]. Social media advertising is a broad term in which different advertising methods like banner ads in social media group pages, user-created product reviews, blogger endorsements, etc.

### **2.3 Short-form Video and Douyin**

Different from YouTube and Twitter, Douyin is specially designed to provide short videos for mobile Internet users. The characteristics of Douyin videos are significantly different from traditional online videos, ranging from video bitrate, size to pop [14]. Ge and Li think user-generated short video ads are new media ads that should affect product sales in a good way [15].

Because this type of short video ad is published on specialized short video social media platforms and is voluntarily posted by users. The sales of products should increase when mobile internet users share their user-generated short videos on a platform and socialize with others.

## **2.4 E-commerce Live Streaming**

Over the past decades, a large and growing body of literature has been investigated. Fang thinks the E-commerce live streaming platforms evolved from video and social networking sites [16]. With the continuous growth of mobile phone users, the public has recognized the subversion of traditional communication mode. Mobile video live broadcasting breaks through the limitations of PC for live broadcasting sites and equipment, thus promoting the development of the whole live streaming industry.

## **2.5 Brand Loyalty**

Brand loyalty is defined as "a deeply held commitment to rebuy or patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing" [17]. Customers who exhibit brand loyalty are devoted to a product or service, demonstrated by their repeat purchases despite competitors' efforts to lure them away. Therefore, many researchers have investigated the strengthening of brand loyalty through consumer satisfaction, value for money, brand trust, and brand image, which are critical determinants [18-21].

## **2.6 SOR Model**

The SOR model, stimulus-organism-response, is a theory developed by cognitivism in psychology. It is widely used in marketing to explain consumer behavior to emphasize the importance of consumer psychological activity. External stimuli cause psychological changes in consumers, which in turn influence their internal or external reactions. This article argues that in the SOR model, external triggers (S) in the form of live features, streamer interactions, and scenario environment will lead to internal satisfaction or perceived trustworthiness (O), which in turn will lead to purchase intentions (R) or trigger purchase behavior.

# **3. Method**

## **3.1 Research Design**

The paper used established scales to conduct an online survey with the items translated into Chinese. Participants assessed the items on a 5-point Likert scale (1 = strongly disagree, 5 = Totally Agree) and were asked to name a familiar brand and fill out the survey accordingly. Questions are divided into five parts. All these questions are to measure how customers like the way of advertising and how the effect is on customers' purchase behavior.

## **3.2 Data Collection**

The experimental scene of the study was set in the online shopping environment of a research company (Credamo) in China. Young people, current university students between 18 and 30, were selected as the test sample. To find out the feature of people who tend to watch more live streaming, on the frequency of watching, the survey is limited to people who answer 3-5 (Totally Agree, Partially Agree, and Neither Agree or Disagree) were chosen. Part of the data was deleted due to the short answering time or other unqualified situations. The sample of this study consists of 150 valid data.

The sample characterization is shown in Table I. The sample is mainly composed of women (61.33%) as respondents. It has its variations regarding the educational level, but the highest concentration is undergraduates (81.33%). It is also possible to report that about 40.67% are interested in Dress Collocation, followed by 32.67% with Mukbang. 66.67% of respondents spend ¥1000-¥2000 each month, and 73.33% work and partially depend on family. More than half of the responders used at least one way to consume in advance, for example, Ant Credit Pay and Ant Cash Now by Alipay.

Table 1. Sample Characterization.

Questions	Options	No.	Percentage
Gender	Female	92	61.33%
	Male	58	38.67%
Educational Level	Undergraduate	122	81.33%
	Graduate	25	16.67%
	Doctor	3	2.00%
Frequency	5-Strongly Agree	19	12.67%
	4-Agree	66	44.00%
	3-General	65	43.33%
Category	Cosmetic Recommendations	33	22.00%
	Dress Collocation	64	40.67%
	Mukbang	49	32.67%
	Jewelry Recommendations	2	1.33%
	Other	2	1.33%
Monthly Consumption	Less than ¥1000	11	7.33%
	¥1000-¥2000	100	66.67%
	¥2000-¥3000	35	23.33%
	more than ¥3000	4	2.67%
Source of Income	All depend on family	39	26.00%
	Work and partially depend on family	110	73.33%
	Economic independent	1	0.67%
Prepayment	One way	82	54.67%
	Two ways	20	13.33%
	Never consume in advance	48	32.00%

Source: Prepared by the authors based on the research data

### 3.3 Data analysis

The questionnaire was distributed on a large scale, and SPSS27.0 and other data analysis software were used to analyze the data collected by the questionnaire. Descriptive analysis, reliability analysis, effect analysis, and correlation analysis for analysis were used in this paper. The reliability analysis of the questionnaire is to investigate the reliability of the questionnaire measurement, which refers to the internal consistency of the measured results.

## 4. Result

### 4.1 Reliability and Factor Analysis Result

In order to ensure the accuracy of empirical data, Cronbach's  $\alpha$  value was used to test its reliability. A total of 150 sample data were collected. The reliability test result, namely, the reliability value of the overall scale, was  $0.837 > 0.8$ , indicating that the scale in this questionnaire had good reliability for analysis.

Table 2. Reliability Analysis.

Cronbach's Alpha	N of Items
.837	23

The validity test of the scale is to prove better than the questionnaire is suitable for this empirical study. The validity can be tested by factor analysis to see whether the scale structure classification is reasonable.

Table 3. KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.787	
Bartlett's Test of Sphericity	Approx. Chi-Square	821.654
	df	253
	Sig.	.000

As shown from Table III, the value of KMO is 0.787, which is between 0.7-0.9, indicating that the scale in this questionnaire is suitable for factor analysis. Bartlett sphericity test results below: The Chi-square value is 821.654, which is significant, proving that the corresponding P-value (0.000)  $< 0.05$ . Therefore, the Bartlett sphericity test has significance.

#### 4.2 Descriptive Data

Regarding the price attraction scale, the questions are presented in Table II, showing the percentage of each scale level selected by the respondents and demonstrating how much the price impacts them.

Table 4. Descriptive Data of Price Attraction Scale.

	Totally Agree	Partially Agree	Neither Agree nor Disagree	Partially Disagree	Strongly Disagree
Promotional Discount	20.00%	70.67%	8.67%	0.67%	0.00%
	26.00%	44.00%	27.33%	2.00%	0.67%
	19.33%	54.00%	21.33%	4.67%	0.67%
	13.33%	45.33%	24.67%	14.00%	2.67%
	20.00%	42.67%	24.67%	8.67%	4.00%

Source: Prepared by the authors based on the research data

Table 5. Descriptive Data of Interactivity Scale.

	Totally Agree	Partially Agree	Neither Agree nor Disagree	Partially Disagree	Strongly Disagree
Interaction with the streamer	13.33%	56.00%	24.67%	6.00%	0.00%
	26.67%	62.00%	8.67%	2.67%	0.00%
	12.67%	38.67%	43.33%	4.67%	0.67%
Interaction with other customers	13.33%	51.33%	24.67%	9.33%	1.33%
Interaction with the product	17.33%	58.00%	20.00%	3.33%	1.33%
Interaction in the platform	25.33%	53.33%	15.33%	6.00%	0.00%

Source: Prepared by the authors based on the research data

Table 6. Descriptive Data of Virtual Environment Immersion Scale.

		Totally Agree	Partially Agree	Neither Agree nor Disagree	Partially Disagree	Strongly Disagree
Entertainment	12	17.33%	54.67%	26.00%	2.00%	0.00%
Remove a Sense of Empty	13	4.00%	14.67%	20.00%	42.67%	18.67%
Escape from the Reality	14	13.33%	28.00%	23.33%	24.00%	11.33%

Table 7. Descriptive Data of Virtual Environment Immersion Scale.

		Totally Agree	Partially Agree	Neither Agree nor Disagree	Partially Disagree	Strongly Disagree
Impulsive Trait	15	10.00%	26.67%	30.67%	28.67%	4.00%
	16	5.33%	14.00%	14.00%	44.67%	22.00%
	17	8.00%	35.33%	26.67%	25.33%	4.67%
	18	20.67%	42.67%	21.33%	14.00%	1.33%

Table 8. Descriptive Data of Impulsive Purchasing Behavior Scale.

		Totally Agree	Partially Agree	Neither Agree nor Disagree	Partially Disagree	Strongly Disagree
Instant Gratification	19	9.33%	32.00%	38.67%	20.00%	0.00%
Psychology	20	11.33%	24.00%	24.00%	33.33%	7.33%
Utility to Ignore	21	10.00%	25.33%	24.67%	30.67%	9.33%
Consumption Plan	22	10.67%	40.67%	17.33%	26.00%	5.33%
Buy Blindly	23	10.00%	37.33%	26.00%	18.67%	8.00%

### 4.3 Regression Data

The regression analysis of this study involves two models. In Model 1, the independent variables are frequency and variable 1-4. In Model 2, frequency and variable 1 are deleted based on Model 1. Meanwhile, the dependent variables of model 1 are impulse consumption behavior. In Model 1, Sig. of variables were smaller than 0.05 except Variable 1, so deleting this variable and conducting the regression again. In Model 2, it can be seen from Table X that the R Square value of a model is 0.442, which means gender and education level can explain 44.2% of impulsive consumption behavior.

Specific analysis shows that the regression coefficient values of variables 2-4 are 0.282, 0.244, and 0.291, respectively, and all of them show significant significance, indicating that variables 2-4 have a significant favorable influence on impulse consumption behavior. Compared with the other two independent variables, the regression coefficient value and significance of frequency and variable 1 were lower.

Table 9. Coefficients.

	B	Std. Error	Beta		R Square	Adjusted R Square	F
(Constant)	0.450	0.159	2.832	0.005			
frequency	0.073	0.043	0.132	1.690	0.093		
1 variable1	0.001	0.078	0.001	0.010	0.992		
variable2	0.230	0.089	0.214	2.582	0.011	0.454	0.435
variable3	0.239	0.067	0.264	3.591	0.000		F=23.980
variable4	0.258	0.082	0.257	3.134	0.002		P=0.000
(Constant)	0.437	0.158	2.771	0.006			
2 variable2	0.282	0.080	0.262	3.529	0.001	0.442	0.431
variable3	0.244	0.066	0.269	3.690	0.000		F=38.614
variable4	0.291	0.079	0.290	3.668	0.000		P=0.000

## 5. Discussion

For the hypothesis made in the opening chapter, the hypothesis of H1 is not valid in the epidemic time conditions with the university student group. H2, H3, and H4 are all validated to be accurate. At the same time, the price factor in H1 is a more critical positive influence factor in the views of several scholars but has less influence on users in this report. In this paper, the live e-commerce interaction factors significantly impact consumers' mindless consumption, and the main findings and insights are as follows.

Firstly, the correlation and regression analysis results validate the research hypothesis H3 of this study: virtual environment immersion is positively correlated with impulsive consumption behavior. It indicates that e-commerce live streaming presents a contextual and ambient stimulus to the product by creating it in the consumption space. According to the S-O-R theory, this contextual stimulus triggers an innate response from the organism. The greater the user's immersion in e-commerce live streaming, the more frequent the irrational consumption behavior of the audience [22]. The immersion generated by the audience in the e-commerce live streaming is a positive emotional experience, which can be reflected in the audience's immersion in the e-commerce live streaming to dissipate negative emotions and enjoy the company.

Secondly, H4 of this study involves variable 4: impulsive trait. From the dimension of the user profile, the questionnaire data yielded a normal distribution with the impulsive consumption behavior of consumers. In the live e-commerce context, female is more likely to produce impulsive consumption than male. In the scope of university students, most of those who make consumption are undergraduate candidates. The majority of university students surveyed had a combination of family support and their jobs, and their monthly disposable income was not significantly different. The age difference was relatively small, while education level was positively correlated with rational consumption. This conclusion is consistent with the findings of Huang et al. [23].

However, multiple factors such as product types and personal characteristics of the streamers can interfere with whether they are impulsive to purchase. The elements can be further investigated in subsequent studies. In addition, impulsivity is a relatively stable individual difference variable. It varies from person to person and is deeply rooted in a person's personality. More impulsive buyers are likely to experience more substantial and more frequent impulse purchases than the average consumer. Wolman defines impulsivity as the psychological traits that arise in response to a stimulus, a vital antecedent variable for impulse buying. The intention to consume a product creates an irresistible urge to buy the outcome [24].

Thirdly, research related to H2 has different views from different scholars. From the data in this article, it is clear that in the e-commerce live streaming scenario, for variable 2 of this report, the interactivity of the streamer has a more significant impact on the impulsive consumption behavior of users. The situational communication and scenario interaction dimensions play an important role in inducing users to generate consumption behavior experiences. Streamers usually create a persona based on their characteristics and display diverse charisma, positively impacting consumers' consumption inclusion and purchase intentions [25].

In the streaming, the streamer's communication and attention to consumers will give consumers a sense of realism and intimacy of face-to-face chat. This cheerful and pleasant feeling makes consumers lower their guard and enter a relaxed and comfortable mind flow. In addition, real-time information dissemination technology breaks the time and space constraints. The immersive space created by live streaming shortens the distance between streamer, product, and customer and constitutes a specific consumption scene of e-commerce live streaming. Such spatial scenarios significantly improve the user's consumption experience, thus making it easier for users to unconsciously consume in the sense of immersion. Therefore, the interactivity of the streamer has a more significant impact on consumers' willingness to make impulsive purchases in a live e-commerce scenario.

However, some scholars believe the opposite. A report published by iResearch suggests that consumers focus more on the product itself and the product display when watching live streaming



[26]. Consumers are more interested in being perceived as the product presentation and the product itself. Wu Na et al. argue that atmospheric cues in live e-commerce scenarios directly impact consumers' impulse purchase intentions [27]. In comparison, social presence and interaction with the streamer did not now trigger consumers' impulse purchase intentions.

In particular, for a relatively uncommunicative group under the epidemic, the interactivity of the streamer is crucial. The streamer acting as a KOL provides a more comprehensive and in-depth introduction of the product, using his image to influence consumers who will trust, rely on and love them, and even become more and more emotionally involved, resulting in many mindless consumption behaviors.

Fourthly, the survey result does not hold H1. Variable 1: price attraction has less influence on users, which is different from scholars' views, as more scholars believe that price greatly influences users' consumption. On the one hand, the relationship between price attractiveness, image constructiveness of the streamer, and impulsive consumption behavior are significant and positive [28]. Similarly, Chen's research concluded that offer attributes and instant two-way interactivity directly and positively influence consumers' purchase intentions, with offer attributes having a more significant direct impact on purchase intentions than instant two-way interactivity [29]. This conclusion suggests that although people's living standards have improved in today's society, live shoppers still prefer products with reasonable prices. However, in this study, the price is not the first influential factor for the university student group. The survey indicates that most students have family support and working income and spend less during the epidemic due to less going out. In a more extended period of development, social living conditions generally improve.

On the other hand, the existence of a price discount mechanism is widespread in live streaming. Almost every live streaming has a specific discount mechanism, and prices are generally lower than official shops. Therefore, the price factor is weaker, and Du Hengfeng also confirmed this point in reverse from the merchant's perspective that there is nothing right or wrong with price wars [30]. Relying on price alone does not always have an advantage, while costs have a natural bottom line - a good profit line for merchants. This profit line can be zero or even negative, but this bottom line dictates that price wars cannot go on indefinitely [30]. The price gradually becomes weaker in consumers' perceptions and becomes a landing point for businesses to compete viciously without providing social benefits from economic development. In addition, for the young group, university students are more likely to consider the immersive feeling and fun that live streaming brings. Xu's research indicates that live streaming entertainment, knowability, and merchandise attractiveness can significantly increase the inner satisfaction of university customers [31]. The most substantial impact on satisfaction is due to the fun nature of live streaming. Having celebrities as hosts in the live streaming and various live programs can attract university students to watch. Xu's conclusion coincides with the paper's view that price concessions are not the primary factor for the university community in the post-epidemic period, which provides a valid basis for suggestions on the construction of the university community's consumption philosophy and the live strategy of the e-commerce platform.

## **6. Conclusion**

Through the questionnaire method and data analysis, this paper finds price attraction is less influential for the consumption impulse of university students' group during the epidemic, which is different from the previous conclusions given to the study of a wide range of groups. A more detailed analysis for specific conditions and the influence of particular groups for this paper is about interactivity, environment immerses, and impulsive traits. Based on this, university students can form good consumption habits, and e-commerce live streaming can harvest a basis for opinion reference on attracting specific groups. Moreover, in most similar papers, psychology's relevance is strong for studying e-commerce live consumption audience-oriented.

This study focuses more on the factors affecting the audience of e-commerce live presence and the analysis of the marketing strategy of the communication subject. Meticulous user interval makes up

for the partial vacancy of this kind of research in the epidemic among university students' group; however, the small sample size will lead to experimental conclusions. However, the small sample size leads to limitations. The independent variables concerning the users themselves can be further explored in future in-depth studies utilizing in-depth interviews to complement and improve the theoretical research model. Future research will also base on the impact of e-commerce live streaming on the consumption behavior of university students. It plans to compare whether the behavior of university students in e-commerce live streaming has changed after the epidemic and whether the impact of the epidemic period on the consumption habits of university students has been continued. Finally, the methodological basis of the study should be strengthened, and further studies should be conducted to acquire sufficient empirical research and data analysis capabilities to achieve a more in-depth excavation and analysis of the survey.

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