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Full Research Paper

A Study on the Impact of Short-Video Product Placement Advertising on Viewers Ad Adoption Intention: A Perspective of ELM and Social Learning Theory

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Abstract: [Purpose/Meaning] Short-video platform is currently a new mainstream social media entertainment platform. The way of placing product advertisements in short videos is increasingly accepted by more people. Exploring the influencing factors of viewers' intention to adopt short video product placement ads is of great significance for further mining the commercial value of short-video advertising and promoting the maturity of the e-commerce module in short-video platforms. [Method/Process] Based on ELM and social learning theory and combined with the characteristics of short-video product placement ads, this study constructs a model about the impact of product placement ads on viewers' ads adopt intention. The empirical research obtained 304 samples through way of questionnaire, and verified the model with SmartPLS 3. [Results/Conclusions] First, product-celebrity matching degree and plot-realistic matching degree positively affect the usefulness of perceived advertising information, and perceived usefulness positively affects viewers' advertising adoption intentions. Second, viewers may ignore discount their own beliefs and imitate others through observational learning, and both discount own beliefs and imitating others positively affect the intention of advertising adoption. Based on the research conclusions, this research provides corresponding marketing suggestions for short video makers and short-video platforms.

Keywords: Short-video product placement ads, ELM, Social learning theory, Ad adopt intention

1. INTRODUCTION

With the popularity of short-video worldwide, such as Douyin and Tik Tok, a new social media advertisement in the form of short-video is becoming more and more popular. Especially in China, short-video advertising is becoming the mainstream form of marketing in China's mobile Internet era. More and more short video bloggers are selling products by embedding product advertisements in entertaining short-videos^[1]. Short-video platforms also need a new e-commerce form to achieve the closed loop of the business model and attract more high-quality internet celebrities to settle in.

Whether in China's Douyin, Kwai, or overseas Tik Tok and other short-video platforms, there are a large number of Internet celebrity bloggers who provide funny short-video content with plots to capture viewers' attention. The product placement ads in this study means: when the internet celebrities reach a large number of followers, they will try to implant product ads in their entertainment short-video plots to guide everyone to pay attention to the selling point of the product or directly guide them to purchase, which is a good way for them to obtain profit. This type of product placement ads were usually used in movies, TV series or variety shows in the past, but now it is creatively applied in short-video with plot. Compared with short-video advertisements that directly promote products, this type of ad hidden in plots of short-video is more entertaining and causes less disturbance to viewers. In the meantime, compared with the product/brand placement ads of traditional social media such as Instagram, WeChat, and Weibo, the new short-video placement ads have the following advantages: first, traditional social media's native embedded advertisements have a strong and obvious marketing purpose,

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and the ways of placement is rigid, so that it is difficult to be favored by the majority of users. However, product placement ads in short-video display the target product in a more entertaining and vivid way, which can effectively increase the willingness of viewers to accept similar ads; Second, in the era of "short-video fever", attractive enough short video advertisements will be considered as high-quality content to be pushed by platform to viewers of very large quantity. This is an opportunity not to be underestimated for these Internet celebrities.

However, this kind of marketing in short-video platform is not yet fully mature. How to promote more viewers to pay attention to product placement ads is still a difficult problem for us. Only by encouraging viewers to adopt the persuasive ads provided, will they continue to learn more about the products, search for the products actively and even pay for them. Therefore, in order to further understand the internal process of viewer' adoption of short-video placement ads and explore which factors will significantly affect viewers' intention to adopt, we conducted an empirical study on it.

Until now, online video advertising marketing methods mainly include the ads inserted in the interval between plots in videos, native video ads, product or brand placement ads and so on. Many scholars have conducted various researches on online video marketing. In recent years, scholars have focused their research on the following aspects: users' attitudes towards advertising or intention to accept online video advertising^[2], discussing the inconvenience brought by advertising^[3], the impact of video marketing on consumers' online purchase intentions^[4], the quality of experience in online video advertising^[5], and so on. Shon M(2020) analyzed the unfavorable factors that caused consumers to block the video ads, and results show that the use of personal information has the greatest impact on it^[3]. With the background of beauty and health products, Alharthey B K(2021) considered customer satisfaction as an intermediary to study the influencing factors of online video marketing on consumer purchase intentions, and the results showed that the ads have a positive impact on customer satisfaction, which in turn has a positive impact on customers' online purchase intentions^[4]. With the goal of optimizing the quality of online video advertising experience, Bulkan U(2020)proposed a novel model for inserting advertisements into online videos^[5]. The proposed model performed well in the evaluation of a controlled test environment.

There is less research on short-video marketing in emerging short-video platforms such as Tik Tok and Douyin. Liu G(2019)explored the impact of short-video marketing on consumer brand attitudes in their research^[6]. Chen X(2020) studied how to choose the right KOLs(Key Opinion Leader) and arrange their advertising campaigns for short-video marketing of products in order to maximize the marketing effect^[7]. Mou J B(2020) compared the video marketing strategies of two video platforms, Tik Tok and YouTube, to propose an effective social media video marketing strategy for the company^[8]. But there is almost no research on product placement in short-videos. In the past, most research perspective of product placement focused on placement in movies, TV series, games and variety shows^[9]. Therefore, this research focused on studying the viewers' intention to adopt advertisements information for product placement in short-video plots, so that the results can expand the research related to short video marketing, and we also can provide effective marketing suggestions for enterprises.

Regarding advertising effects, past scholars usually used TAM (Technology Acceptance Model) or UTAUT (Unified Theory of Acceptance and Use of Technology) model to explain the internal reason and process of users adopting or accepting advertisements^{[10][11]}. Meanwhile, some scholars believed that ELM(Elaboration Likelihood Model) in the field of information processing can also be used to explain the influence of persuasive advertising information on consumers. People will process advertising information from both the central path and the edge path, and promote the change of the final advertising attitude^[4]. The essence of short video placement advertising is content marketing that conveys persuasive information and advertisers expect to show the selling point of the target product through vivid short video content. Therefore, this article used ELM as the

basis to explain the advertisement information processing when viewers facing short video placement ads. In addition to the characteristics of traditional product placement ads, short-video placement ad also has its own characteristics from short-video platforms: 1) You can clearly learn the identity information of the celebrity who post the ad video and browse his past short-video works; 2) You can see the thumbs-ups, comments and reposts of many other users on this short-video placement ad. Both of these two characteristics are not available in traditional scenarios. Based on the above analysis, this article studied the influencing factors and internal mechanism of short-video product placement ads on viewers' intention to adopt ads from three aspects: the advertising content itself, the characteristics of the internet celebrity and the interactive atmosphere.

2. THEORETICAL BACKGROUND

2.1 Information adoption model(IAM) based on ELM.

The information adoption model is developed from the Elaboration Likelihood Model (ELM) proposed by psychologists Petty and Cacioppo. The theory of ELM believes that individuals will view the information to be processed from two perspectives, the central path and the edge path, thereby their attitudes towards information will be changed^[12]. The central path refers to an individual's judgment on the central content and quality of the information leading to a change in attitude, while the edge path refers to individual identifies the credibility of the information relying on the assistance of other factors closely related to central information. Sussman and Siegal combined the theories of ELM and TAM to propose a new information adoption model, as shown in Figure 1^[13]. This theory believes that when facing new information, individuals will judge the usefulness of information based on the quality of the information (central path) and source credibility (edge path), and finally decide whether to adopt the information.

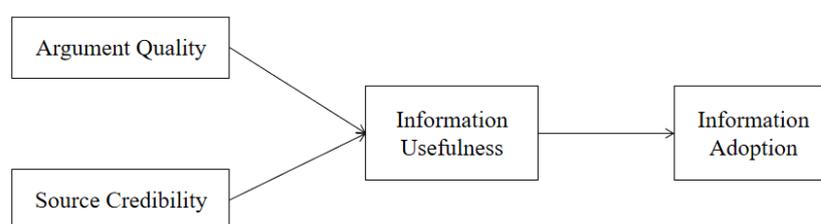


Figure 1. Model of information adoption.

2.2 Social learning theory(SLT).

SLT emphasizes the restrictive effect of social variables on human behavior, and believes that individuals will learn from important social references to determine individual behavior^[14]. The social learning process includes two types: observational learning and reinforcement learning. Observational learning means that the individual learns by observing the behaviors of people around the environment and their behavioral results before acting, so as to avoid unnecessary errors. Therefore, observational learning often leads to herd effect^[15]. There are two main conditions for herding behavior: uncertainty and observation^[16]. In short-video product ads, the content of tens of seconds is very limited for the presentation of product characteristics. Therefore, viewers often have uncertainty about the target product, moreover the interactive mechanism of short-video platform presents users a good way of observing and learning. In such condition, viewers are likely to have herd behavior.

On the other hand, reinforcement learning refers to individuals learning from the consequences of their own actions, emphasizing the experience of the product search process^[17]. As for short-video platform as the main entertainment and social platform, the main motivation of users is to absorb short-video content rather than shopping. And the process of users encountering product placement ads is random rather than active search.

Therefore, this research did not consider the reinforcement learning process and focused on the impact of the observation learning process on users.

3. RESEARCH MODEL AND HYPOTHESES

Based on the above theories and the characteristics of short-video product placement ads, a model of the impact of short-video product placement ads on viewers' intention to adopt is constructed, as shown in Figure 2. This research mainly studied the influencing factors of viewers intention to adopt short-video product placement ads from three aspects: matching, celebrity's reputation and observational learning.

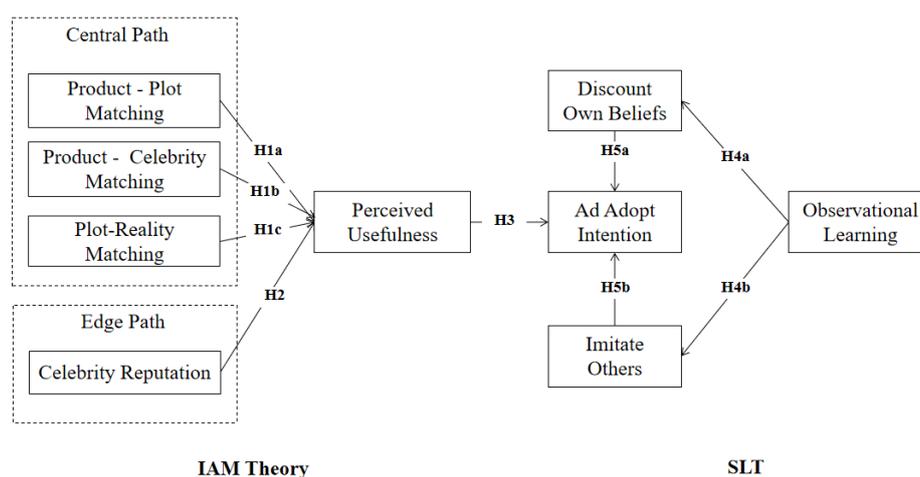


Figure 2. Research model.

3.1 The impact of matching on perceived usefulness.

According to IAM theory, information quality as a central path will affect viewers' perceived usefulness of information. The matching hypothesis was first used to discuss the relevance of the spokesperson's image and the endorsed product or brand^[18]. In the context of short-video product placement ads, Internet celebrities who place product ads in short-videos are similar to previous spokespersons. The difference is that the former involves the matching characteristic between products, plots, Internet celebrities, and reality in short-video content. Therefore, this article used matching as an indicator for viewers to evaluate the central quality of short-video product placement ads to affect perceived usefulness, and we subdivided the matching into three aspects for specific research.

(1)The match between product and plot. In short-video product placement ads, the scenarios where products are used are always often embedded in the original short-video plots to achieve product placement. When the characteristics of the product itself fit well with the plot itself, the viewers will consider it appropriate, thereby increasing the acceptance of the information conveyed by the advertisement. Otherwise, it will easily have a negative impact^[19].

(2)The match between product and celebrity. The Internet celebrity image that appears in the plot serves as the "Transmission Ambassador" of the product image in the embedded advertisement, so that the matching degree between them will significantly affect the viewers' attitude towards advertising and products^[20]. When the celebrity's image is in contrast with the product's image, it will make viewers feel abrupt and affect their perception of the information conveyed by the advertisement. Otherwise, it will make it easier for viewers to accept it.

(3)The match between plot and reality. The plot in the short-video is used to show the product usage scenario. When the viewer thinks that the plot is quite different from reality, it is difficult to form a sense of

substitution for using the product, thereby affecting the perception of advertising information^[19].

Based on the above analysis, the hypotheses of matching are proposed below.

H1a: The degree of match between the product and the plot positively affects the perceived usefulness of short-video product placement advertising information.

H1b: The degree of match between the product and the credibility positively affects the perceived usefulness of short-video product placement advertising information.

H1c: The degree of match between the plots and the reality positively affects the perceived usefulness of short-video product placement advertising information.

3.2 The impact of celebrity reputation on perceived usefulness.

According to IAM theory, the credibility of the source as an edge path will affect the usefulness of the user's information perception. Viewers are always not familiar with most bloggers on short video platforms and cannot directly judge the credibility of them. But they can observe the reputation of celebrities to determine the credibility through number of followers on the homepage, the past short-video works of celebrities and comments on the celebrity by other viewers in the comment area. In the research about the influence of advertising information, it is found that the advertisements of well-known celebrities have a stronger persuasive effect^[21]. Therefore, this study inferred that in the context of short-video product placement in advertising, the reputation of the celebrity will be considered as edge path to affect the viewers' perceived usefulness of advertising information, so the following hypothesis is proposed:

H2: The degree of reputation of the celebrity positively affects the perceived usefulness of short-video product placement advertising information.

3.3 The impact of perceived usefulness on intention to adopt the ads.

According to IAM theory, users' perceived usefulness of advertising information will positively affect advertising adoption behavior. In the context of short-video product placement ads, perceived usefulness refers to the viewer's perception of whether the delivered product advertising information is helpful for them. According to Davis (1989)'s Technology Acceptance Model (TAM), behavioral intention directly positively affects actual behavior^[22]. This study used the intention to adopt the ads instead of the behavior, that is, when viewers think that the advertisement information delivered is useful for them, they will have a intention to adopt the advertisement. Therefore, the following hypothesis is proposed:

H3: Perceived usefulness positively affects the intention to adopt the short-video product placement ads.

3.4 The impact of observational learning.

According to the observational learning process in SLT, in order to avoid unnecessary mistakes and expensive costs, individuals will observe and study the existing behaviors of people around them before acting, and will produce herd behavior when they feel sufficient positive feedback in the learning process. In the short-video platform, observational learning refers to observing the interaction between other viewers and this short-video ad, including the number of likes/comments/reposts and the specific content of comments. Herd behavior mainly includes two aspects, imitating others and discount one's own beliefs^[16].

In short-video product placement ads, imitation refers to observing that when other viewers have a high number of likes/comments/reposts on the short video, and the comment content is biased towards positive adoption of the ad, then the viewer will also choose to adopt the ad. This imitation behavior can save one's unnecessary time and effort, that is, the viewers think that the ads has been tested many others so that they no longer need to be suspicious of the advertisement and they can choose to adopt it directly.

discount one's own beliefs refers to ignoring the information you have obtained about the product and ignoring your degree of preference for the product when you choose to adopt the advertisement. It means

that in the decision-making process, viewers rely more on the observation of other viewers' behavior rather than their own ideas. They only make simple processing of information before making the adoption decision. Based on the above discussion, the following hypotheses are proposed:

H4a: Observational learning positively influences discount one's own information .

H4b: Observational learning positively influences imitating others.

H5a: Discount one's own information positively affects the intention to adopt the ads.

H5b: Imitating others positively affects the intention to adopt the ads.

4. METHODOLOGY

4.1 Measure

This paper obtained data with a questionnaire for empirical research. The questionnaire is divided into two parts. The first part sets up the research context for the participants and presents the measurement items of each variable. The context guides participants to recall the last short-video product placement ads experience and then answer the following items. The second part aims to collect individual demographic information. The measurement items of the study are adjusted with reference to the maturity scale and combined with the characteristics of short-video advertisements, and the items have undergone multiple theoretical verification according to the research purpose to ensure rigor. The final items are shown in Table 1.

Table 1. Measures of constructs.

Factors	Items	Reference
Product-Plot Matching (PPM)	PPM-1: I think the product in the short video is highly relevant to the plot. PPM-2: I think the product appearing in the short video is highly related to the scene presented. PPM-3: I think the product appearing in the short video closely match the characters in the plot.	[23]
Product-Celebrity Matching (PCM)	PCM-1: I think the celebrity is suitable for selling the products recommended in the short video plot. PCM-2: I think the celebrity matches the product sold in the ad.	[20]
Plot-Reality Matching (PRM)	PRM-1: The scene of the product in the short video plot is consistent with the scene it appears in reality. PRM-2: The use of the product in the short video plot is consistent with the way you use it in real life.	[19]
Celebrity Reputation (CR)	CR-1: The celebrity has a strong charm to me. CR-2: The celebrity has a high reputation on the short-video platform. CR-3: The celebrity has a high influence in a certain field.	[24][25]
Perceived Usefulness (PU)	PU-1: I think this short-video ad is helpful for me to some extent. PU-2: This short-video ad helps me make better shopping decisions. PU-3: This short-video ad is useful for me.	[13][26]
Ad Adopt Intention (AAI)	AAI-1: I would like to watch this short-video with ad. AAI-2: I would like to produce like/comment/repost behavior for this short-video with ad. AAI-3: I would like to adopt the information described in this short-video ad as a reference for shopping decisions.	[27]
Observational Learning (OL)	OL-1: I see a lot of people produced like/comment/repost behavior for this short-video ad. OL-2: I can feel that this short-video ad and product are very popular from the comment area of this short video ad.	[28]

Factors	Items	Reference
Discount Own Beliefs (DOB)	DOB-1: My acceptance of this ad content in this short-video does not fully reflect my true preferences DOB-2: I may not accept this advertisement based all on my own beliefs.	[16]
Imitate Others (IO)	IO-1: The most products recommended in the short-video platform are accepted by the majority of users, so I will also try to accept. IO-2: I will follow the views of other viewers to try to accept the product in this ad. IO-3: Many viewers accept this short-video ad and even purchase the product, so I will try to accept it.	[16]

4.2 Data Collection

This study used the Likert 7-point quantitative measurement method, and 1-7 indicate the range of "strongly disagree" to "strongly agree" in turn. The questionnaire was published on online and offline channels in various age groups. Individuals who participate in the questionnaire can receive a small payment to show our gratitude. The questionnaire collection time lasted from 2021.1.09 to 2021.1.14. A total of 356 questionnaires were collected in 6 days. After excluding invalid questionnaires and questionnaires of participants who had never met short-video product placement ads, 304 valid questionnaires were finally obtained.

4.3 Sample Description

The basic statistics of the samples are shown in Table 2. The results show that the ratio of men and women is not much different. The ages are mainly concentrated in the 18-30 years old. The education background is mainly undergraduate. The samples cover all parts of the frequency of use of short-video APP. Most participants have used short-video APP for 6 months to 2 years.

Table 2. Demographic profile of the respondents.

Variables	Item	Frequency	Percent%
Gender	Male	159	52.3%
	Female	145	47.7%
Age	Under 18	53	17.43%
	18-30	149	49.02%
	31-40	63	20.72%
	Over 40	39	12.83%
Highest education	High school or below	106	34.87%
	Undergraduate	139	45.72%
	Master degree or above	59	19.41%
The time of using short-video apps every day	Within 30 min	90	29.61%
	30min-1hour	86	28.29%
	1-2 hours	74	24.34%
	More than 2hours	54	17.76%
How many years have been using short video apps	Within 6 months	63	20.72%
	6months-1year	98	32.24%
	1-2years	81	26.64%
	More than 2 years	62	20.39%

5. EMPIRICAL ANALYSIS

5.1 Reliability and validity analysis.

This study used the PLS Algorithm of SmartPLS 3 to verify the reliability and validity of the measurement model. The Cronbach's Alphas (α) value and Composite Reliability (CR) value can reflect the reliability of the model, and the Average Variance Extracted(AVE) value can reflect the aggregate validity of the model. The test method for discriminative validity is to compare the square root of AVE and the absolute value of the correlation coefficient between this variable and other variables. Table 3 and Table 4 respectively show the reliability, aggregate validity and discriminative validity of the model.

It can be seen from Table 3 that outer loadings of all items are greater than 0.8, CR values are greater than 0.9, and α values are between 0.822 and 0.921, indicating that the model has good reliability. The AVE values of all variables are between 0.785 and 0.860, indicating that the model has good aggregation validity. It can be seen from Table 4 that the correlation coefficient between the variables (the values in the columns below the diagonal line) is less than the square root of the AVE value of each variable (the value of the diagonal line), indicating that the model has good discrimination validity.

Table 3. Related indicators of reliability and aggregate validity.

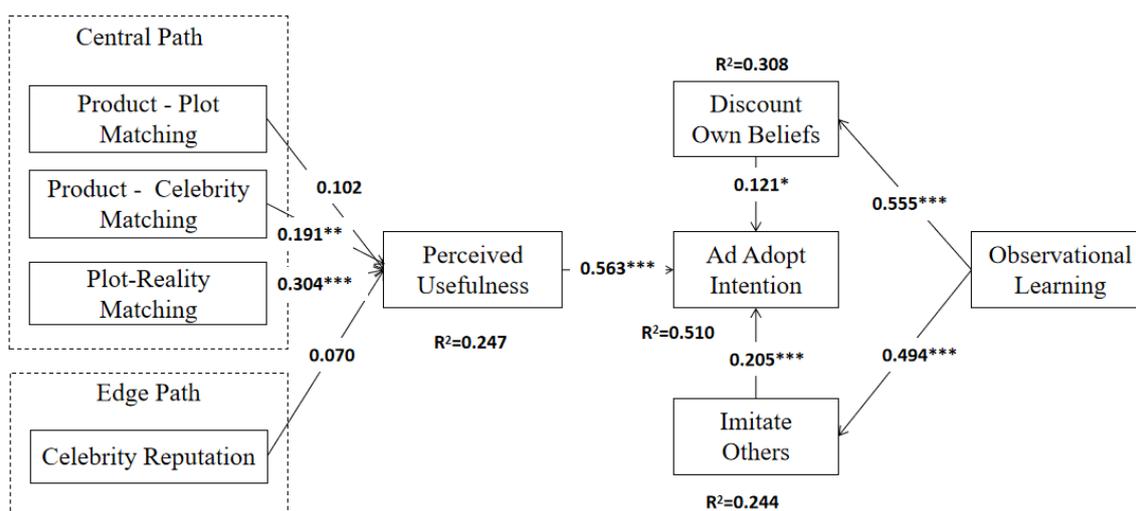
Variable	Scale items	Outer loading	AVE	CR	α Vale
PPM	PPM-1	0.910	0.788	0.918	0.866
	PPM-2	0.879			
	PPM-3	0.874			
PCM	PCM-1	0.931	0.852	0.920	0.827
	PCM-2	0.915			
PRM	PRM-1	0.941	0.858	0.924	0.836
	PRM-2	0.911			
CR	CR-1	0.932	0.855	0.946	0.921
	CR-2	0.945			
	CR-3	0.896			
PU	PU-1	0.897	0.785	0.916	0.863
	PU-2	0.900			
	PU-3	0.860			
OL	OL-1	0.940	0.860	0.925	0.839
	OL-2	0.915			
DOB	DOB-1	0.919	0.849	0.918	0.822
	DOB-2	0.923			
IO	IO-1	0.925	0.826	0.935	0.895
	IO-2	0.900			
	IO-3	0.902			
AAI	AAI-1	0.895	0.804	0.925	0.878
	AAI-2	0.914			
	AAI-3	0.881			

Table 4. Related indicators of discriminative validity.

	PPM	PCM	PRM	CR	PU	OL	DOB	IO	AAI
PPM	0.888								
PCM	0.401	0.923							
PRM	0.323	0.324	0.926						
CR	0.192	0.333	0.407	0.925					
PU	0.291	0.354	0.428	0.277	0.886				
OL	0.173	0.189	0.251	0.257	0.392	0.928			
DOB	0.167	0.239	0.268	0.208	0.348	0.555	0.921		
IO	0.125	0.180	0.357	0.216	0.286	0.494	0.475	0.909	
AAI	0.349	0.334	0.487	0.253	0.664	0.433	0.415	0.423	0.897

5.2 Model verification

This study used the Bootstrapping algorithm of SmartPLS 3 to test the significance level of each path for 1000 sampling times, and verifies the hypotheses of each path in the model based on the path coefficient. The model verification result is shown in Figure 3.



Note: ***, ** and * respectively represent $p < 0.001$, $p < 0.01$, $p < 0.05$.

Figure 3. Model verification.

From the results in Figure 3, we can see that the hypotheses H1b, H1c, H3, H4a, H4b, H5a, and H5b are valid, and the H1a and H2 are not valid. R^2 reflects the level of interpretation of the dependent variable by the independent variable. In the field of user behavior research, when the R^2 value is greater than 0.2, it is considered that the variable has a high degree of interpretation. In this study, the R^2 values for perceived usefulness, discount one’s own beliefs, imitating others, and ad adopt intention are 0.247, 0.308, 0.244, and 0.510, respectively, which are all greater than 0.2, indicating that the model constructed in this study has a good fit.

5.3 Result analysis

In the hypotheses about matching, H1a is not significant but both H1b and H1c pass the significance test and are both positively affected, indicating that viewers will pay more attention to product - celebrity matching and plot-reality matching when evaluating the usefulness of advertising information. In the meantime,

product-plot matching is not necessarily the main reference standard for viewers. It may mean that the viewers have a high tolerance for the level of product-plot match or even they are used to watching the short-video ads with mismatched product-plot. When the viewers think that the Internet celebrity is suitable for promoting such product and the plot is not too absurd, they will still be willing to accept the information in the advertisement.

The celebrity reputation as the edge path is not significant in this study, which means that viewers will not generally judge the value of the advertisement based on the reputation of the blogger when evaluating a short-video product placement ad. This result may be due to the emergence of a lot of small Internet celebrities in the short-video era in recent years. They will spend most of their attention on improving the quality of their short videos in order to occupy the attention of broad viewers from other celebrities. Therefore, in such an environment, viewers are also concerned more about the quality of the video content than who create this short-video.

The path coefficient of H3 is positive and significant, indicating that when viewers believe that the advertising information is useful to them, they are likely to have a willingness to adopt the advertisement.

In the herd effect test based on SLT, H4a, H4b, H5a and H5b are all significant, which shows that the convenient interaction mechanism set up by the short video platform does have a very significant impact on the users, and they generally consider viewers' interactive response as the criterion for deciding whether to adopt the advertisement. Even if the target product in the advertisement may not be completely in line with their own beliefs, they will think that the product that has been tested by a large number of other people deserves some attention.

6. RESEARCH INSPIRATION

Based on the above research results, the marketing suggestions for short-video platforms and short video advertisement makers are as follows.

The first suggestion is for Internet celebrities who have a large number of fans and have a product marketing plan through short-videos. On the one hand, you need to choose products that suit your own image and temperament for marketing, rather than consider the popularity of product as the only main reference standard. If it does not meet the expectations of consumers for your image to sell this product, you may not get good results even if the product is hot now. On the other hand, although the creativeness and novelty in advertising helps to form a deep impression in people's mind, do not pursue the novelty too much and lead to the video ad is absurd and divorced from reality, which still can not win the trust of consumers.

Secondly, the Internet celebrities should not relax their control over the quality of video content because of the large number of followers they already have. Under the current distribution mechanism in short-video platforms, good content will be distributed to a larger viewers, so that your video ad will have a chance to get more likes, comments and reposts. Driven by the viewers herd mentality, the Matthew effect will be generated, making the marketing effect of your short video advertisements beyond your imagination.

Finally, for short video platforms. If they want to achieve a closed-loop business model through e-commerce promotion, 1) they must use technical methods to help short-video makers to create higher quality and more innovative short-video ads. 2) To guide users to more actively interact with short-videos through optimization of APP functions. 3) To push the short-video ads to more accurate viewers to improve marketing efficiency through algorithm optimization.

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