

Original Research Article

Building WOM from Consumer Involvement for Virtual Idols Endorsement

Abstract

In the era of the meta-universe, virtual idol endorsement is a rising issue in recent years. Through virtual idol endorsement, some moral and illegal problems can be avoided. Virtual idol endorsement, can be said to be one of the feasible solutions of brand spokesperson, which is conducive to the development of marketing strategy and sustainable development of enterprises. The purpose of this study is to sort out the variable relationship in virtual idol endorsement. Data was collected by questionnaire survey and a total of 425 valid samples were received. Findings reveal that consumer involvement has a significant and positive impacts on brand image, brand awareness and words of mouth, which are the three powerful antecedents. Moreover, both brand image and brand awareness are the mediators in the virtual idol endorsement context. Such the product design of an enterprise should think from the consumer orientation was drawn to enterprises.

Keywords: meta-universe, virtual idol, involvement, brand image, brand awareness

1. Introduction

In consumers purchase decision, they need to confirm whether the product's attributes and functions meet their needs. Therefore, enterprises or marketers can use spokespersons familiar with consumers to deliver product information in advertisements, so as to gain consumers' attention, trust and purchase more easily [1]. This kind of product or brand spokesperson, most of the local residents familiar with celebrities, such as singers, film stars, star players, experts, etc. Spokesperson is a widely used marketing and communication strategy, which has attracted the attention of researchers for a long time. Early studies had focused on the characteristics of effective spokespersons, such as trustworthiness, professionalism, and attractiveness [2]. But sometimes the effect of endorsement is difficult to measure, spokesmen can only have a positive effect under certain conditions.

Furthermore, some film and television stars engage in illegal activities or obtain benefits through improper means, resulting in the phenomenon of many bad performers. These activities, such as drug taking, drug trafficking and whoring, not only damage

their personal reputation, but also damage the corporate image and brand image of the companies that represent them. Accordingly, in March 2021, the State Radio and Television Administration drafted the Radio and Television Law of the People's Republic of China (Draft for Comments). Where the main creators of radio and television programs violate relevant laws and regulations and cause adverse social influence, the competent radio and television department under The State Council may impose necessary restrictions on the broadcast of relevant programs [3]. The Cyberspace Administration of China has also issued several administrative measures to regulate and manage the activities and behaviors of artists' endorsements [4]. In this case, the traditional real person endorsement advertising has been compressed, and a new mechanism is needed to respond to the phenomenon of bad artists and the food circle culture. Virtual idols can replace real people in advertising endorsement without any moral problems, which is one of the feasible spokespersons.

In the context of the gradual maturity of computer technology and artificial intelligence, the concept of metaverse was put forward in 2020, and virtual idol came into being. Later, China Artificial Intelligence Industry Development Alliance released the 2020 White Paper on the Development of Virtual Human, which pointed out that digital human refers to virtual characters with digital appearance. In addition to the appearance, behavior and thought of the owner, digital human also has the ability to recognize the external environment and communicate with people. The appearance of virtual characters seems to share the role of traditional spokesmen.

However, the introduction of virtual idol is short under the concept of meta-universe. The acceptance of consumers and enterprises, and the effect of endorsement are all problems that need to be sorted out by adopting virtual idol endorsement. In other words, consumers' information about virtual idols is limited and their involvement may not be high. In this case, how they perceive the brand image and brand awareness represented by virtual idols is an urgent issue to be clarified. In addition, the virtual idol endorsement has just been launched, and its popularity may need to be confirmed. In the future, more people still need to give positive publicity. In other words, virtual idol endorsement is facing problems of involvement, brand image, brand awareness and word-of-mouth. Moreover, for virtual idol endorsement, the influence of consumer involvement on brand image, brand awareness and word-of-mouth remains to be clarified by empirical research. Since it is a four-variable relationship, is there a mediating effect of mediating variables? Accordingly, the research questions of this paper are summarized as follows:

- Research question 1: In the context of virtual idol endorsement, what is the predictive power of consumer involvement on their perceived brand image, brand

awareness and word-of-mouth?

- Research question 2: In the context of virtual idol endorsement, what is the relationship among consumer involvement, word-of-mouth, brand image and brand awareness?
- Research question 3: In the context of virtual idol endorsement, what is the mediating effect of consumers' perception of brand image and brand awareness?

To solve the above questions, this paper aims at developing a set of theoretical models and measurement tools, and find a suitable virtual idol spokesperson for empirical research. The purpose of this study is: 1) to discuss the status of consumer involvement, word-of-mouth, brand image and brand awareness in the context of virtual idol endorsement; 2) The relationship between consumer involvement, word-of-mouth, brand image and brand awareness; 3) The mediating effect of consumers' perception of brand image and brand awareness; and 4) to offer managerial recommendations.

For the purpose of this study, considering feasibility and data collection, this paper chooses Axi as the spokesperson of virtual idol. Axi represents young, fashionable and lifestyle figures. At present, she has endorsed cars, online flowers, female cosmetics and other products, and has a high popularity of virtual idols among young people. In addition, since Axi represents a young population, the maternal population in this study is also mainly young population under 35 years old, and this population is mainly used in the follow-up investigation. The following chapters describe the literature review and hypothesis, research methods, empirical analysis and results, and conclusions and suggestions respectively.

2. Literature review and hypothesis development

2.1 The concept of involvement and its impacts

There is a consistent finding in the existing literature that the more engaged people are in special topics, the more motivated they are to complete their tasks or achieve their goals [5,6,7]. What consumers pay attention to is important and meaningful to them, so they have strong motivation to invest in it [8,9]. Moreover, different levels of involvement will lead to different ranges of information processing processes [9] When a consumer has a high degree of involvement in a particular brand/product, she/he may spend more time evaluating the advantages and disadvantages of the product/brand, and they will collect and process their information in detail [7]. Empirical research has pointed out that the level of involvement directly affects their satisfaction and recommendation intention on products [9,10,11,12], consumer involvement has a positive impact on brand image and loyalty in film and television tourism [13]. In other words, in the context of virtual idol endorsement, the more consumers perceive the

importance of virtual idol endorsement and its special significance in their lives, the more likely they are to give positive evaluation and recommendation intention. That is to say, consumers' involvement in virtual idol endorsement may directly affect their word-of-mouth. Accordingly, hypothesis 1 is proposed in this study:

Hypothesis 1: In the virtual idol endorsement situation, consumers' involvement in virtual idol endorsement may directly affect their word-of-mouth.

Furthermore, involvement will also affect brand image and brand awareness [14,15,16]. The research results of non-profit undertakings show that the degree of consumers' involvement in point-to-point B&Bs will significantly affect their destination image, familiarity and behavioral intention [17]. When traveling, consumers can search for free accommodation places through the online platform based on saving accommodation costs (importance), and stay at the destination homestayers can increase the opportunity to contact and communicate with local people and meet new friends at the destination and other places (meaningful). When consumers invest more in accommodation, their better understanding of destination image will result in better perceived image and recommendation intention. Another case of purchasing decision in the food industry shows that the more involved consumers are in food, the more likely they are to have positive evaluation, recommendation intention and re-purchase intention [18]. The more consumers are involved in food, it may be that they have health awareness and food safety concepts, which are vital to their health and life safety, so they will attach great importance to these items. They compare multiple brands in the purchase decision-making process, and consumers may give preference to products with a better brand image. In other words, the stronger the motivation of consumers for a particular brand (the higher the degree of involvement), the more positive the perception of brand image. Liu [19] showed that the motivation of consumers significantly improved their brand awareness and brand image perception of food tourism. In the context of virtual idol endorsement, consumers perceive the higher the importance of virtual idol endorsement and its special significance in their lives, and they are likely to give the brand a higher image evaluation. That is to say, consumers' involvement in virtual idol endorsement may directly affect their brand image and brand awareness. Accordingly, hypothesis 2 and hypothesis 4 are proposed in this study:

Hypothesis 2: In the context of virtual idol endorsement, consumers' involvement in virtual idol endorsement may directly affect their brand image.

Hypothesis 4: In the context of virtual idol endorsement, consumers' involvement in virtual idol endorsement may directly affect their brand awareness.

2.2 The concept of brand image and its influences

In the era of advertising explosion, in order to maintain the existing market performance, a brand must create and maintain its image [20,21]. Therefore, brand image plays a virtual and key role in deciding marketing strategies and empowering managers to change or update future marketing work [22].

Brand image is the representative process of branding. It is the brand association held in individual memory and the brand perception reflected in the memory [23]. It is the consumer's perception of the memory in the network association [21]. This definition, like consumers' perception of the image of a particular store, can be formed by a combination of tangible and intangible factors, such as visible physical facilities and invisible services [24]. In other words, when consumers see brand symbols, characters and logos of enterprises, they can quickly associate with products and services of enterprises, including product functions, attributes, product or brand positioning, price orientation and service quality. Therefore, consumers have a better perception of the brand image of a specific product, and they have higher purchase intention to give positive evaluation and recommendation [9,25,26].

In this study, the virtual idol Axi represents young, fashion, and lifestyle, and the products Axi represents also appeal to young, fashion, and lifestyle. When consumers have a better perception of the brand image of Axi (virtual idol), they may be more willing to give a higher positive evaluation of the products endorsed by Axi and have a higher recommendation intention. Accordingly, hypothesis 3 is proposed in this study:

Hypothesis 3: In the relationship between the products endorsed by the virtual idol Axi and consumers, consumers' perceived brand image of the virtual idol may significantly affect their word-of-mouth.

2.3 The concept of brand awareness and its influences

Brand awareness refers to customers' and potential customers' familiarity with an enterprise's products and brand name recognition [27]. If customers are unable to recognize the differences between brands, their purchase decisions may appear random. So it is important for customers to remember and recognize brands. Such brand recognition and memory of customers also become the basic restriction of customers to brands under different circumstances [28,29].

Consumers are sometimes hesitant to make purchase decisions and tend to buy brands they know or even know well. He may conduct a data search or ask others for

their opinion on a particular product before making a purchase decision. When the brand name of the product is higher, it is more likely to be mentioned and become one of the brands considered in the purchase decision. In this case, brand awareness represents consumers' memory and recognition of the brand, which can help consumers improve decision-making efficiency. Empirical studies show that brand awareness may be affected by price intermediaries [30], which can influence consumers' purchase intention [27]. Brand equity of young consumers will be affected [31].

The research suspects that when a particular brand has high visibility and can be known and discussed by consumers, the brand is more likely to be positively evaluated and recommended. Taking the virtual idol Axi as an example, when her popularity is high, the products she represents are more likely to attract attention, and consumers may be willing to give higher positive evaluation and recommendation to the products she represents [20]. In other words, the higher the popularity of the virtual idol brand perceived by consumers, the higher the word-of-mouth may be generated. Accordingly, hypothesis 5 is proposed in this study:

Hypothesis 5: In the relationship between the products endorsed by the virtual idol Axi and consumers, consumers' perceived brand awareness of the virtual idol may significantly affect its word-of-mouth.

2.4 The mediating effects of brand image and brand awareness

In the relationship between consumer involvement, brand image and word-of-mouth, as previously stated, consumer involvement will affect brand image by enhancing word-of-mouth and behavioral intention of recommendation [17,14]. It also influences recommendation and word-of-mouth behavior through brand image [15].

This means that brand image may act as an intermediary variable between consumer involvement and word-of-mouth, with an intermediary effect. In other words, in the context of virtual idol endorsement, the brand image-word-of-mouth relationship and consumer participation-word-of-mouth relationship may exist separately. However, once we consider both consumer involvement and brand image to predict word-of-mouth, how much the explanatory power of the variable increases is an open question. Accordingly, hypothesis 6 is proposed in this study:

Hypothesis 6: In the relationship between products endorsed by virtual idol Axi and consumers, consumers' perceived brand image of virtual idol endorsement may play a mediating role in the relationship between consumer involvement and word-of-mouth.

Similarly, in the relationship between consumer involvement, brand awareness and word-of-mouth, as previously stated, consumer involvement will enhance word-of-mouth and behavioral intention to recommend [17], which will affect brand awareness [14]. It also influences recommendation and word-of-mouth behavior through brand awareness [15].

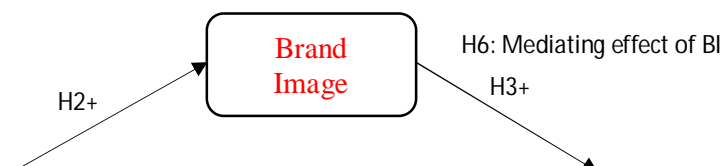
This means that brand awareness may act as an intermediary variable between consumer involvement and word-of-mouth, with an intermediary effect. In terms of the virtual idol endorsement situation, consumers' involvement in virtual idols is like their reference motivation. The stronger the reference motivation, the more they invest in virtual idols, and the higher the brand awareness they perceive [19]. In this scenario, the higher the probability of positive word of mouth. Accordingly, hypothesis 7 is proposed in this study:

Hypothesis 7: In the relationship between products endorsed by virtual idol Axi and consumers, consumers' perceived brand awareness of virtual idol endorsement may play a mediating role in the relationship between consumer involvement and word-of-mouth.

3. Research methods

3.1 Research framework and hypothesis

The research framework of this paper is shown in Figure 1 based on the above literature discussion. First, in the relationship between consumer involvement, brand image, brand awareness and word-of-mouth of virtual idols perceived by consumers, consumer involvement may significantly and positively influence word-of-mouth (H1); consumer involvement may significantly and positively influence brand image (H2); brand image may significantly and positively influence word-of-mouth (H3); consumer involvement may significantly and positively influence brand awareness (H4), and brand awareness may significantly and positively influence word-of-mouth (H5) are the initial hypothesis of this study. Secondly, this study suspects that brand image and brand awareness has a significant mediating effect. That is, brand image plays a significant mediating role in the relationship between consumer involvement and WOM (H6); and brand awareness plays a significant mediating role in the relationship between consumer involvement and WOM (H7).



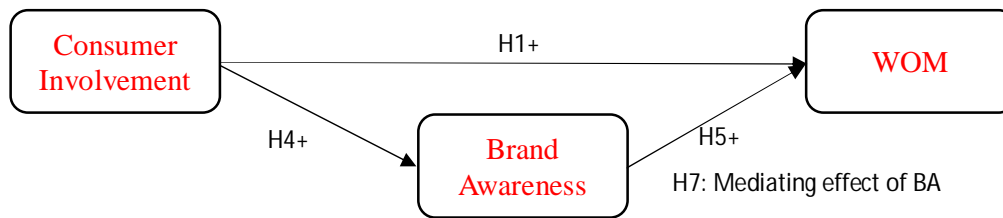


Figure 1 Research framework

3.2 Variable definition and measurement

Referring to [previous studies \[32,33,34,35\]](#), brand image is defined as "consumers' overall evaluation of the image, name and particularity of the virtual idol Axi". Brand awareness is defined as "consumers' overall evaluation of the symbol association and variation degree of the virtual idol Axi"; Word-of-mouth is defined as "consumers' positive evaluation and recommendation of the virtual idol Axi"; It defines involvement as "consumers' overall evaluation of the meaning and importance of the virtual idol Axi".

In terms of measure items, referring to [previous studies \[32,33,34,35\]](#) and other literatures, three questions were researched and drafted on brand image. Such as "Axi is special", "Axi is very different from other idols", "I am familiar with Axi's name", etc.; Three items of brand awareness were developed, such as "I know what Axi looks like", "When I see Axi, I quickly associate certain brand symbols", and "I can distinguish Axi among different idols". Two items were adopted to measure word of mouth, such as "I will take the initiative to tell others the advantages of Axi", "I will take the initiative to recommend the products endorsed by Axi", etc. Consumer involvement in the research and formulation of three questions, such as "The brands endorsed by Axi are meaningful", "the brands endorsed by Axi are very important to me", "Watching Axi's endorsement advertisements has become a part of my life", etc.

In terms of measures, all of them were measured by Likert's 5-point scale, with 5 indicating strong agreement and 1 indicating strong disagreement. The higher the score, the higher the degree of agreement. In addition, in terms of demographic variables, this study designed five questions, including gender, age, educational level, occupation and average monthly income.

3.3 Questionnaire Survey

The topic of this study is the brand image, brand awareness, word of mouth and involvement of virtual idols, and the topic is relatively novel. Since the character setting of the virtual idol Axi tends to be young, fashionable and life-oriented, and

considering the feasibility and accessibility of follow-up questionnaire survey, this study mainly focuses on college students and young people as the population. Regarding to the sampling method, quota sampling is carried out according to maternal characteristics. In terms of data collection, questionnaire was built by this study on the Questionnaire Star Platform (<https://www.wjx.cn/vm/P3skoJ3.aspx#>). Students were recruited to join the survey through the forward student groups. Moreover, young people who knows Axi were encouraged to join the survey from WeChat groups of those students and research team members. The questionnaire was conducted from November 2022 to December 2022, and a total of 425 valid questionnaires were received. In order to ensure the authenticity of respondents' answers and the validity of the questionnaire, this study limits each IP to be used only once, and the respondents can only participate in the answer if they can specify at least one product endorsed by Axi.

In terms of sample characteristics, 67.3 percent were female and 46.5 percent were male. In terms of age, respondents' age who less than 20 years old accounted for 25.1%, 20-29 years old accounted for 41.2%; 30 to 39 years old 15.6%; 18.1% were over 40 years old. In terms of educational level, at about 16.2% were junior high school or below, 21.9% were senior high school, 35.2% were junior college, 26.7% were bachelor degree or above, and the majority of respondents were junior college or above. In terms of average monthly income, approximately 60.3% earned less than 3,000 yuan (RMB), 28.3% earned between 3,000 yuan and 6,000 yuan, 8.3% earned between six and 8,000 yuan, and 3.2% earned above 8,000 yuan.

4.Results

4.1 Discrimination analysis

In this study, the total score of each measure items were summed, and the top 27% of the higher measure items and the bottom 27% of the lower ones were divided into high group and low group, respectively. Independent t-test was used to identify and test the identification of different subjects. The results showed that the T-values of the 11 measure items were all at significant level, and the proposed measurement items in this study had a degree of discrimination for different subjects.

4.2 Descriptive statistics

In terms of descriptive statistics (see Table 1), the average value ranges from 3.01 to 3.39, which belongs to the degree of general agreement, and the standard deviation ranges from 1.36 to 1.579. The higher the average degree of agreement is the words of mouth of the virtual idol brand, while the lower one is the brand image. The standard deviation of brand image is large, and the respondents' opinions differ

greatly. In terms of reliability, Cronbach's Alpha values ranged from 0.912 to 0.961, indicating high reliability, and the measurement tools had good internal consistency. In terms of validity, the questions were sourced from literature with content calibration. It has been tested by experts and has adequate expert validity.

Table 1 Descriptive statistics, validity and reliability analysis

Items	M	SD	SK	KU	FL	VE%	Alpha
Consumer Involvement (INV)							
inv1	3.28	1.375	-.305	-1.080	.936	88.6%	0.936
inv2	3.34	1.415	-.310	-1.161	.944		
inv3	3.14	1.412	-.086	-1.245	.944		
Brand Image (BI)							
bi1	3.13	1.572	-.149	-1.510	.969	92.1%	0.961
bi2	3.20	1.545	-.207	-1.442	.959		
bi3	3.10	1.554	-.112	-1.473	.962		
Brand Awareness (BA)							
ba1	3.35	1.483	-.369	-1.247	.917	85.2%	0.912
ba2	3.39	1.402	-.332	-1.121	.921		
ba3	3.12	1.467	-.100	-1.329	.929		
Words of Mouth (WOM)							
ri2	3.31	1.380	-.295	-1.102	.978	95.6%	0.955
ri3	3.34	1.366	-.329	-1.080	.978		

4.3 Validity and reliability analysis

In the validity analysis, the measure items come from literature, which has the theoretical basis and content calibration. Secondly, the questionnaire has been reviewed by experts and relevant researchers, which indicating the expert validity. In this study, the maximum variation method was adopted. Through principal component analysis, the process of factor analysis was covered. Bartlett test was used to determine whether there was factor analysis and the degree of communication between the items of the problem. Factors with eigenvalue greater than 1 were extracted, and the factor loading was greater than 0.6. The results showed that Bartlett test achieved significant significance. It is suitable for factor analysis (see Table 1).

In terms of consumer involvement in virtual idols, the commonality of items was all greater than 0.5, and a factor with a characteristic value greater than 1 was extracted, with a cumulative explanatory variation of 88.6%. In terms of factor load, each question was assigned to only one factor, and the factor load was slightly greater than 0.7, indicating that the scale involved had a good construction calibration. In

addition, the reliability coefficient is greater than 0.7, indicating that the scale has good internal consistency. On the whole, the virtual idol involvement scale adopted in this study has good validity and reliability.

Regarding to the brand image of virtual idols, the commonality of items is greater than 0.5, and a factor with an eigenvalue greater than 1 is extracted, with a cumulative explanatory variation of 92.1%. In terms of factor load, each question belongs to only one factor, and the factor load is slightly greater than 0.7, indicating that the brand image scale has an adequate construction calibration. In addition, the reliability coefficient is greater than 0.7, indicating that the scale has an adequate internal consistency. On the whole, the virtual idol brand image scale adopted in this study has an adequate validity and reliability.

In considering to the brand awareness of virtual idols, the commonality of items is greater than 0.5, and a factor with a characteristic value greater than 1 is extracted, with a cumulative explanatory variation of 85.2%. In terms of factor load, each question was assigned to only one factor, and the factor load was slightly greater than 0.7, indicating that the scale of brand awareness had a good construction calibration. In addition, the reliability coefficient is greater than 0.7, indicating that the scale has good internal consistency. On the whole, the virtual idol brand awareness scale adopted in this study has good validity and reliability.

In terms of the WOM of virtual idols, the commonality of the projects is greater than 0.5, and a factor with a characteristic value greater than 1 is extracted, with a cumulative explanatory variation of 95.6%. In terms of factor load, each question was assigned to only one factor, and the factor load was slightly greater than 0.7, indicating that the scale of brand reputation had a good construction calibration. In addition, the reliability coefficient is greater than 0.7, indicating that the scale has good internal consistency. On the whole, the virtual idol brand reputation scale adopted in this study has good validity and reliability.

4.3 Correlation analysis and discriminant validity

The correlation analysis results are shown in Table 2. The results show that the correlation coefficients among all variables, such as brand image, brand awareness, words of mouth and involvement, all reach a significant level. It indicates that the higher the perceived brand image of the respondents to the virtual idol, the higher the perceived brand awareness, the higher the word of mouth, and the higher the involvement degree. Moreover, the higher the perceived brand awareness to the virtual idol, the words of mouth degree and the higher the involvement degree were met. Lastly, the higher their involvement degree of virtual idol, the higher the respondents' words of mouth can be found. Besides, the correlation coefficient

reached a significant level and was less than 1, indicating that the variables had good discriminative validity. Therefore, this study can continue to carry out follow-up analysis.

Table 2 Results of correlation analysis

VAR.	M	SD	INV	BI	BA	WO
INV	9.76	3.96	1			
BI	9.43	4.50	.796**	1		
BA	9.87	4.02	.802**	.898**	1	
WOM	6.65	2.69	.862**	.808**	.845**	1

*p<0.05, **p<0.01

4.4 Test of initial hypothesis model

In order to verify the predictive power of consumers' involvement on their perceived brand image, brand awareness and word-of-mouth in the context of virtual idol endorsement (Research Question 1), this study adopts regression analysis to test the influence of consumer involvement on the brand image, brand awareness and word-of-mouth (Model 1, Model 2, and Model 3). The test results are summarized in Table 3. As shown in Table 3, the three models have adequate compatibility reading ($F=122; 729; 763$), and the collinearity of independent variable and dependent variable is not serious ($VIF<10$). The results show that consumer involvement has a significant and positive influence on word-of-mouth, brand image and brand awareness. And the influence coefficients are 0.86, 0.7 and 0.80, respectively. Therefore, without considering other factors, the predictive power of consumer involvement on word-of-mouth is greater (0.74) than brand image (0.63) and brand awareness (0.64). Consequently, in the context of virtual idol endorsement, consumer involvement is indeed an important pre-factor for word-of-mouth, brand image and brand awareness.

Table 3 The impact of consumer involvement on initial hypothesis model

Paths	M1		M2		M3	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
INV-WO	.862	35.0				
INV-BI			.796	27.0		
INV-BA					.802	27.6
R^2_{WO}	.743					
R^2_{BI}			.633			
R^2_{BA}					.644	

F	122	729	763
VIF	1	1	1

*p<0.05, **p<0.01

Furthermore, in order to clarify the relationship among consumer involvement, word-of-mouth, brand image and brand awareness in the context of virtual idol endorsement, this study conducted the test of Model 4, Model 5 and model 6. The results are shown in Table 4. First of all, this study takes word-of-mouth as dependent variable and consumer involvement, brand image and brand awareness as independent variables to test the influence of the three determinants on word-of-mouth (Model 4). The results showed that the model fit was adequate (F=1280) and the collinearity problem was not serious (VIF<10). Only consumer involvement and brand awareness had significant and positive influence on word-of-mouth. The predictive power of independent variable on dependent variable was 0.808. Accordingly, hypothesis 1 and hypothesis 5 are supported, while hypothesis 3 is not.

Next, this study examines the impact of consumer involvement on brand image (Model 5) and brand awareness (Model 6) respectively. The analysis results of model 5 and model 6 showed that the model was well matched (F=729; 763) and the collinearity problem was not serious (VIF<10). Consumer involvement had a significant and positive impact on brand image and brand awareness. The predictive power of independent variable on dependent variable was 0.796 and 0.802. Accordingly, hypothesis 2 and hypothesis 4 are supported.

Table 4 Hypothesis testing to initial proposed model

Paths	M4		M5		M6	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
H1:INV-WO	.505	13.579				
H2:INV-BI			.796	27.0		
H3:BI-WO	.062	1.220				
H4:INV-BA					.802	27.6
H5:BA-WO	.385	7.512				
R ² _{WO}	.808					
R ² _{BI}			.633			
R ² _{BA}					.644	
F	1280		729		763	
VIF	3.05-5.79		1		1	

*p<0.05, p<0.01

4.5 Tests of mediating effect

In order to verify the mediating effect of consumers' perception of brand image and brand awareness in the context of virtual idol endorsement, regression analysis of models 7- to model 12 were conducted in this study. The results are summarized in Table 5 and Table 6.

Table 5 tests the mediating effect of brand image on the relationship between consumer involvement and word-of-mouth. This study conducts regression analysis in accordance with the three steps of mediating test. Model 7 tested the influence of the independent variable (consumer involvement) on the dependent variable (words of mouth), and the results showed that the model fit was adequate ($F=122$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement had a significant and positive impact on words of mouth. Model 8 tested the influence of independent variables on intermediary variables (the influence of consumer involvement on brand image), and the results showed that the pattern fit was adequate ($F=729$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement had a significant and positive impact on brand image. Model 9 tested the influence of independent variables and mediating variables on dependent variables (the influence of involvement and brand image on word-of-mouth), and the results showed that the fit of the model was adequate ($F=766$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement and brand image had a significant and positive impact on word-of-mouth. As the three models are all valid, brand image has partial mediating effect, and its mediating effect has been confirmed. That is, hypothesis 6 is supported.

Table 5 Test of mediating effect of brand image

Path	M7		M8		M9	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
INV-WO	.862	35.0			.597	15.980
INV-BI			.796	27.0		
BI-WO					.334	8.942
R^2_{WO}	0.743				0.784	
R^2_{BI}			0.633			
F	122		729		766	
VIF	1.00		1.00		2.725	

* $p<0.05$, $p<0.01$

Table 6 reports the test of the mediating effect of brand awareness on the relationship between consumer involvement and word-of-mouth. Similarly, this study conducts regression analysis in accordance with the three steps of mediating test.

Model 10 tested the influence of independent variable (consumer involvement) on dependent variable (words of mouth). Results showed that the model fit was adequate ($F=122$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement had a significant and positive impact on words of mouth. Model 11 tested the influence of independent variables on intermediary variables (the influence of involvement on brand awareness), and the results showed that the model fit was adequate ($F=763$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement had a significant and positive impact on brand awareness. Model 12 tested the influence of independent variables and mediating variables on dependent variables (the influence of involvement and brand awareness on word-of-mouth). The results showed that the fit of the model was adequate ($F=893$), and there was no obvious collinearity problem ($VIF<10$). The consumer involvement and brand awareness had a significant and positive impact on word-of-mouth. As the three models are all validated, brand awareness has a partial mediating effect, and its mediating effect has been confirmed. That is, hypothesis 7 is supported.

Table 6 Test of mediating effect of brand awareness

Path	M10		M11		M12	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
INV-WO	.862	35.0			.518	14.529
INV-BA			.802	27.6		
BA-WO					.429	12.052
R^2_{WO}	0.743				0.809	
R^2_{BA}			.644			
F	122		763		893	
VIF	1.00		1		2.806	

* $p<0.05$, $p<0.01$

4.6 Discussion

This study presents three research questions, which are discussed as follows through statistical analysis. First, in the context of virtual idol endorsement, consumer involvement has a significant and positive impact on brand image, brand awareness and word-of-mouth. The three coefficients are all higher than 0.7, indicating that consumer involvement is an important antecedent of the three variables, and the analysis results are consistent with previous studies [26,27,32,33,35].

In the era of metaverse, enterprises use virtual idols as spokespersons, while facing the problems of consumers' involvement in the public endorsement. It is found that the more consumers are involved in the virtual idol, the better they perceive the

virtual idol's endorsement and words of mouth; the better the brand image and the higher the brand awareness. To sum up, the higher the degree of consumers' involvement in virtual idols, the more important the status of virtual idols in the hearts of consumers, and the endorsement activities of virtual idols represent certain significance to consumers. In this case, the virtual idol Axi is taken as an example. Consumers' involvement in Axi will increase their access to photos, news search and other information of Axi. They may identify with the young and fashionable character positioning of Axi. At this time, consumers may be more willing to convey positive information and give positive evaluation to the products endorsed by Axi. In other words, consumer involvement significantly positively affects word-of-mouth.

Secondly, the more involved consumers are, the better the brand image they perceive. It shows that the status of virtual idols in their minds is based on consumers' sufficient information collection and comparison of different virtual idols. So that they can perceive the particularity of virtual idols and the difference between them and other idols. Considering to Axi in this case, consumers may compare real idols with virtual idols, and feel that the virtual idol Axi will not change his mind and other characteristics. So they are willing to give Axi a higher brand image evaluation. At this time, consumers are willing to give higher brand image evaluation to the products endorsed by Axi. In other words, consumer involvement has a significant and positive impact on brand image.

Moreover, the higher the degree of consumer involvement, the higher their perception of brand awareness. This indicates that the degree of awareness of virtual idols in their minds may be based on more consumers' information contact and multiple comparisons. Since consumers have been aware of the virtual idol's endorsement activities, and there may be a lot of discussion around him. So that the issue of virtual idol can maintain a high mind, they will perceive a higher degree of awareness of virtual idol. Regarding to Axi in this case, consumers may collect different endorsement roles and cases of virtual idols, and have some preference for Axi and other virtual idols. When the media and people around them (reference group) continuously discuss virtual idols, they are more likely to appear like Axi and give Axi a higher brand awareness evaluation. At this time, consumers are willing to give higher brand awareness evaluation to the products endorsed by Axi. In other words, consumer involvement has a significant and positive impact on brand awareness.

In addition, the better the brand image consumers perceive, the better their words of mouth. It indicates that the endorsement of virtual idols can transform his image into the brand image of the products he represents, and enable consumers to give a higher positive word of mouth and evaluation. When consumers perceive the virtual idol Axi as special than other idols, they are willing to give higher positive word of mouth and

evaluation to the brands whose products Axi represents. Similarly, the more consumers perceive brand awareness, the better their word-of-mouth. This implies that the endorsement of virtual idols can transform their popularity into brand awareness of the products they represent, and enable consumers to give higher positive word of mouth and evaluation. When consumers perceive that the virtual idol Axi is more well-known than other idols, they are willing to give higher positive word of mouth and evaluation to the brands whose products Axi represents.

Finally, consumer perception of brand image has an intermediary effect, which is the intermediary variable of the relationship between consumer involvement and word-of-mouth. This shows that in terms of consumer involvement and brand image, both can individually improve the words of mouth of virtual idol endorsement. However, when both paths were considered at the same time, word of mouth was more predictive. In other words, brand image can not only improve the effect of word-of-mouth by itself, but also play a pivotal role in the relationship between consumer involvement and word-of-mouth, helping consumers to participate in the transmission of influence. Regarding to the case of Axi, when consumers perceive Axi's endorsement as meaningful and important, its positive word-of-mouth and evaluation will be improved. However, when consumers perceive the particularity and difference of Axi (the addition of brand image), it can improve the word-of-mouth prediction power.

Similarly, consumer perceived brand awareness has an intermediary effect and is the intermediary variable of the relationship between consumer involvement and word-of-mouth. When consumers can recognize Axi at a glance and quickly distinguish the products and brands endorsed by Axi, they can perceive the brand awareness of virtual idols and more accurately predict the word-of-mouth endorsed by Axi. Moreover, this visibility can also convey the impact of consumer involvement on word-of-mouth. At this time, more highlights the importance of virtual idol brand awareness.

5. Conclusions and Suggestions

In the era of the meta-universe, virtual idol endorsement is a rising issue in recent years. Through virtual idol endorsement, some moral and illegal problems can be avoided. Virtual idol endorsement, can be said to be one of the feasible solutions of brand spokesperson, which is conducive to the development of marketing strategy and sustainable development of enterprises. The purpose of this study is to sort out the variable relationship in virtual idol endorsement, and based on the above analysis, the following conclusions and suggestions are obtained.

5.1 Conclusion

- In terms of the current status of respondents' perception variables, the average degree of agreement is higher for the reputation of virtual idol brands, and the respondents' opinions are consistent. The standard deviation of brand image is large, and the respondents' opinions differ greatly.
- Consumer involvement has a significant and positive impact on brand image, brand awareness and reputation, which are the three powerful antecedents.
- Both brand image and brand awareness have significant and positive effects on word-of-mouth, which can accurately improve word-of-mouth of virtual idol endorsement.
- Brand image and brand awareness are both mediating variables of the relationship between consumer involvement and word-of-mouth, which can effectively improve the predictive power of word-of-mouth of virtual idols.

5.2 Suggestions

The suggestions of this research are divided into three parts: the first part is for enterprises, the second part is for government departments, and the third part is for future researchers.

First, in terms of the enterprise's proposal, the explanation is as follows.

- Based on virtual idol endorsement, consumer involvement has a significant and positive impact on brand image, brand awareness and word-of-mouth, and is the key anthems. The product design of an enterprise should think from the consumer orientation. So that consumers feel that the product is meaningful and in line with their own positioning. In terms of advertising, it should appeal to the meaning and importance of products to consumers. When consumers feel that virtual idol endorsement is meaningful and important (consumer involvement), they are more willing to give higher positive word of mouth and evaluation, higher brand image evaluation and brand awareness evaluation.
- Since both brand image and brand awareness have a significant and positive impact on word-of-mouth, enterprises should think about how to improve their brand image and brand awareness. Brand image is the overall impression of the brand collected by consumers after receiving various messages sent by the brand. Enterprises should not only pay attention to the design and information transmission of text, totem, symbol, etc., but also pay more attention to product quality, personnel service, production and marketing process and social image. Secondly, brand awareness is the degree to which consumers can recall or identify the brand. Besides grasping various information transmission mechanisms, enterprises should also pay attention to the design and quality of advertisements

and marketing activities. These factors are regarded as the path to enhance brand awareness. When consumers feel that the overall image of virtual idol endorsement is good (brand image) and the overall awareness level is high (brand awareness), they are more willing to give more positive word of mouth and evaluation.

- Brand image and brand awareness are both mediating variables of the relationship between consumer involvement and word-of-mouth, and enterprises should strengthen the management of these two factors. The role of internal organism factors in behavior of mediating variable illustrates the role of brand image and brand awareness in the relationship between consumer involvement and word-of-mouth. Both brand image and brand awareness can help enterprises to better predict the word-of-mouth of virtual idol endorsement. Enterprises should establish the monitoring and management mechanism of brand image and brand awareness. In a competitive environment, this can highlight the competitiveness of enterprises.

Secondly, in terms of government departments, the explanation of the recommendations is as follows.

- Virtual idol endorsement is an emerging issue, and relevant regulations may need to be improved. Therefore, it is suggested that the government should strengthen the regulation and management of the scope of use of virtual idols. Such as the intellectual property rights of virtual idols, virtual idol endorsement advertising content issues.
- In addition, compared with real people advertising endorsement, virtual idols have no moral problems, and government departments should make plans to support and promote virtual idols.
- Finally, virtual idol endorsement can improve the brand image and brand awareness. Government departments can cooperate with enterprises to invest in public service advertising activities and policy promotion, and use virtual idol endorsement to improve the image of government departments and establish a better reputation.

Finally, this study has sorted out the relationship between consumer involvement, brand image, brand awareness and word-of-mouth in the context of virtual idol endorsement, and made the following suggestions for future research:

- Theoretically, this study only considers three variables that affect the word-of-mouth of virtual idols. There may be more suitable or more important variables, such as motivation, value, trust, etc. Therefore, future research will

continue to analyze the impact of these variables on endorsement and word-of-mouth.

- In terms of methods, this study adopts the questionnaire survey method to analyze the relationship between variables, and the sustainable application of data mining and other methods in the future research to analyze consumers' demand for virtual idol endorsement.
- This study only focuses on the endorsement of the virtual idol Axi. Future studies can compare the endorsement differences among multiple virtual idols.

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