

Perceived Value Dimensions of Virtual Idols and Its Influence Mechanism on Consumer Adoption Intention Based on Grounded Theory

Junzhou Zhao^{1, a}, Yanwen Ruan^{1*, b}, Hongjian Qu¹

Chao Sun¹, Xinjie Ye¹, Haiyi Yang¹

¹School of Textiles and Fashion, Shanghai University of Engineering Science, Shanghai, China

^az1197872463@icloud.com, ^bywruan@sues.edu.cn.

Abstract. In response to the rapid technology development but inadequate attention on consumer value of virtual idol, this study aims to explore the connotation of perceived characteristics of virtual idols, dimensional indicators, and the mechanism of their influence on consumers' adoption intention. Through the method of in-depth interviews and grounded theory, this study found the perceptual characteristics of virtual idols including nine elements: appearance characteristics, temperament characteristics, movement characteristics, voice characteristics, storylines, story scenes, character features, technical empowerment, and personality empowerment. Based on the Stimulus-Organism-Response theory, a theoretical framework established to explain the influence mechanism: from perceptual characteristics of virtual idols, to social identity, to consumption value and emotional value, to consumers' adoption intention. This study can help virtual idol enterprises get closer to consumers, and promote the healthy development of virtual idols.

Keywords: virtual idols, perceived value, adoption intention, grounded theory.

1. Introduction

With the rise of the "metaverse", the development of social media and the advancement of related technologies, virtual idols have been developing rapidly in China in recent years [1]. Meanwhile, the flourishing of the virtual idol industry and the psychological tendency of idol worship have promoted people's acceptance and love of virtual idols, making virtual idols a new cultural landscape [2]. Virtual idols are developing towards the trend of specialization, diversification and intelligence, and will cover more audience groups and drive a wider market and demand.

However, contrary to the rapid growth, the overly sudden development speed makes virtual idols present problems such as superficial prosperity but serious core homogenization and difficulty in commercial realization [3]. In response to this status quo, researchers have generally explored the commercial worth of virtual idols from the perspective of the entertainment industry [2], while neglecting the fundamental factor that generates the commercial value of virtual idols, the experience value. Surprisingly, though, there has been very little examination of the perceptual characteristics and the interactivity of virtual idols from the perspective of consumer experience [4]. Research from this perspective can help virtual idol businesses get closer to consumers, at the same time, promote the healthy development of virtual idols.

Since the research on the perceptual characteristics of virtual idols has not yet established a sufficiently mature and well-developed theoretical framework. This study aims to clarify the value dimension indicators of virtual idol perceptual characteristics, their connotation and the influence mechanism on consumers' adoption intention. It examines the perceptual characteristics of virtual idols and explores the psychological and behavioral responses of consumers in the process of exposure to virtual idols using in-depth interview and grounded theory methods. This is of great significance to the operators of virtual idols.

2. Virtual idol perception literature research

2.1 Research on the connotation of virtual idol perception

As a new thing in recent years, scholars have defined the connotation of virtual idols from different perspectives and fields. Some scholars defined a virtual idol as an immaterial entity based on information technology and a character activated by digital data [5], while others regarded it as an integer cultural image that performs idol activities in a virtual or realistic scenario [6]. Although there is no unified concept of the connotation of virtual idols, their definitions all revolve around two factors complementing each other: technological capabilities and the real world [1]. Therefore, this study defines a virtual idol as a virtual image that can communicate, broadcast, and establish strong relationships with fans or consumers with the help of technological power, based on Yu's research [7].

Perception is the basis of human mental activity and is the process of observation, attention and re-perception of internal and external information by the self-consciousness [8]. Existing studies generally placed perceptual characteristics in their research scenarios before defining them. So this paper defines perceptual characteristics based on the investigation situation of virtual idols. Perceptual characteristics are the subjective perceptions and judgments that consumers make about virtual idols by relying on experience and intuition in the process of exposure to virtual idols [9].

3. Research related to the dimensional indicators of virtual idols

Scholars have their own opinions on the division of virtual idol perception characteristics. Most of the studies on virtual idols have been conducted from the viewpoints of technical support [10], commercial operation [11], capital value of virtual idols [12], gift economy [13], self-branding [14], and controlling entity [15]. Or analyze from the cases of pan-entertainment [16], virtualization [17], corporate control [18] and so on. Studies from the perspective of consumer perception are rare. A complete theoretical system has not been formed for the connotation, dimensions and influence mechanism of virtual idol perception characteristics on consumers. In the environment of rapid development of virtual idols, what are the elements of the perceived characteristics of virtual idols? How do these elements affect the mechanism of consumers' adoption intention? Understanding the above 2 questions has an important role in promoting the development of virtual idols and is of greater significance for virtual idol operations to enhance their economic value.

4. Research Methodology and Data Sources

4.1 Research Methodology

This study adopts the grounded theory research method, which is exploratory in nature and is a research method that builds a plan from the bottom up by collecting, organizing and analyzing data for a phenomenon or concept [19]. It inductively analyzes from some social phenomena or experiences and feelings so as to form a theory [20], and gradually improves the hypothesis under study through continuous comparison and verification in three core steps: open coding, axial coding, and selective coding [21]. Compared to other methods, grounded theory is more suitable for exploring a phenomenon or concept that is currently unclear and controversial.

4.2 Data sources

This study uses semi-structured interrogations to collect consumers' feelings about the perceived characteristics of virtual idols through online 1-to-1 interviews and make written records as the primary data for this examination. Considering the relative lack of explanation of the perceived characteristics of virtual idols by people with low education, this study mainly selects interviewees

with bachelor degree or above, and the age of the interviewees is between 18 and 30 years old. This group is active in consumption behavior, has greater awareness of virtual idols, has higher internet technology, is more sensitive to new things, and has stronger expression ability. At the same time, the interviewees have been exposed to virtual idols and are users of virtual idols, so they have more personal experience with virtual idols. The final selection of 30 interviewees, this number can ensure that the frequency of the interviewees in education and age is greater than or equal to 1, to avoid the chance error caused by individual differences, and to enhance the reliability of the interview conclusions. The specific information of them is shown in Table 1.

Table 1 Basic information of interviewees

Item	Type	Frequency	Proportion
Gender	Male	12	40%
	Female	18	60%
Education	Bachelor 's degree	30	100%
Age	20-21 years old	24	80%
	22-23 years old	5	17%
	24 years old and above	1	3%
Contact time with virtual idols	1-5 years	16	53%
	6-10 years	11	37%
	10 years or more	3	10%

The interview outline includes three aspects: the connotation of the characteristics of virtual idols, the dimensional indicators of the perceived characteristics of virtual idols, as well as the feedback made by consumers in the process of exposure to virtual idols and the design of the interview questions. In order to verify the reliability and validity of the interview questions, three interviewees were first selected for pre-interviews, and the final interview outline was determined by adjusting and deleting the questions that failed to achieve the expected results in combination with the interviewees' answers. The formal interviews were conducted according to the revised interview outline, and follow-up questions were asked during the interviews based on the interviewees' responses in order to understand the inner psychology of the interviewees as comprehensively and deeply as possible. Each interview lasted between 30 and 60 minutes, and the entire interview was recorded with the knowledge of the interviewee and later organized into a clear transcript. The final sample of 30 valid interviews with a total of more than 30,000 words were obtained by the two methods.

5. Category refinement and model construction

5.1 Open coding

Five of the 30 primary sources were randomly selected for the saturation test, and the remaining 25 primary sources were coded sequentially. In this process, two researchers coded the same original data separately, and then compared and discussed the coding results in order to ensure the rigor of coding. By mining and sorting out the original data, the initial concepts were derived, and the consequences of the open coding were collated, resulting in 49 initial categories.

5.2 Axial Coding

This study considered the correlations among the resulting categories and integrated them with the current socio-cultural context [22]. By analyzing and bearing comparison with the intrinsic logical relationships of the essence, level, and content of the 49 initial categories in the appeal, the preliminary concepts were further compared and generalized to each other, and 16 categories such

as appearance characteristics, temperament characteristics, movement characteristics, voice characteristics, storyline, story scenes, character nature, group identity, and self-identity were finally obtained.

5.3 Selective coding

The selective coding further visualized and theorized the 16 categories established by the main axis coding, sorted out the relationships between the categories [23], and refined the "story line" that could encompass all the categories [24]. The categories related to the perceptual characteristics of virtual idols were selectively coded, and the selective coding, main categories and connotations are shown in Table 2.

Table 2 Selective coding and collation results

Selective Coding	Main Category	Connotation
Personality Traits	Appearance Characteristics	Virtual idol's appearance image related
	Temperament Characteristics	The Temperament of the virtual idol
	Movement Characteristics	Virtual idol's behavior and actions
	Voice Characteristics	Virtual idol's voice
Character setting Traits	Storyline	Character storyline designed by the virtual idol
	Story Scenes	The scenario set by the virtual idol character
	Character Nature	The nature of the virtual idol character itself
Social Identity	Group Identity	The sense of identification with the group with the same experience that the virtual idol audience has in the process of interacting with them
	Self-Identification	Self-identification of the virtual idol audience in the process of interaction with them
Consumption Value	Consumer Adoption Intention	The willingness of consumers to adopt virtual idols
	Capital Value	The value of virtual idols in the economic field
	Cultural Value	The value of virtual idols in the cultural field
Technical Traits	Technology Empowerment	Technology to support the birth or operation of virtual idols
	Personality Empowerment	The meaning given to virtual idols by real people
	Emotional Value	The emotional value that virtual idols provide to their audiences

Except for the emotional value, which is not integrated into the core categories, the remaining 14 main categories of appearance characteristics, capital value, and technology empowerment are selectively coded into 5 core categories according to their intrinsic logic. The 4 main categories of appearance characteristics, temperament characteristics, movement characteristics, voice characteristics can be condensed as personality traits. The 3 main categories of storyline, story scene, and character nature can be summarized as character setting traits.

The 2 main categories of group identity and self-identity can be recapped as social identity. The 3 main categories of consumer adoption intention, capital value, and cultural value can be summed up as consumption, and the two main categories of technological empowerment and personality empowerment can be encapsulated as technological traits. The perceived characteristics of virtual idols mainly include 7 dimensions: personality traits, character setting traits, social identity, consumption value, technical traits, consumer co-creation level, and sense of emotional value.

5.4 Theoretical saturation test

The saturation test was conducted with the 5 interview transcripts set aside to ensure the accuracy and completeness of the coding results. The above 3 steps (open coding, axial coding, and selective coding) were repeated for the reserved 5 interview transcripts, and the resulting coding results were compared with the previous coding results. It was discovered that no new concepts and categories emerged beyond those already established, thus it can be proved that the previous theories on the dimensional factors and influence mechanisms of the perceived characteristics of virtual idols are saturated.

5.5 Construction of the theoretical model

In summary, the results of the above study show that no new concepts and categories emerged after repeated coding. Thus, the theory of influencing mechanisms of the virtual idols' perceived characteristics has been sufficiently saturated. The Stimulus-organism-response Model (SOR model) is derived from stimulus-response theory, which states that a specific situation or external stimulus can evoke a reaction or response [25]. In the model constructed in this paper, the stimulus is the perceived characteristics of the virtual idol. The organism is the sense of emotional value, social identity, and consumption value, and the response is the consumer's adoption intention, which is consistent with the model construction of the stimulus-organism-response model (SOR model).

In the influence of perceived characteristics of virtual idols on consumers' adoption intention, personality traits, character setting traits, and technical traits are the characteristic attributes, which serve as independent variables in the influence mechanism. Emotional value sense, social identity and consumption value as variables in the influence mechanism.

The perceived characteristics of virtual idols affect consumers' adoption intention through three particular paths: first, by stimulating consumers' sense of emotional value, second, by stimulating consumers' sense of social identity, and third, by influencing the consumption value of virtual idols. The perceived characteristics of virtual idols influence consumers' emotional value sense, social identity, or consumption value in single or compound form, and ultimately drive consumers' adoption intention.

Based on the mechanism of the influence of the perceived characteristics of virtual idols on consumers' adoption intention, a theoretical model is constructed, as shown in Figure 1.

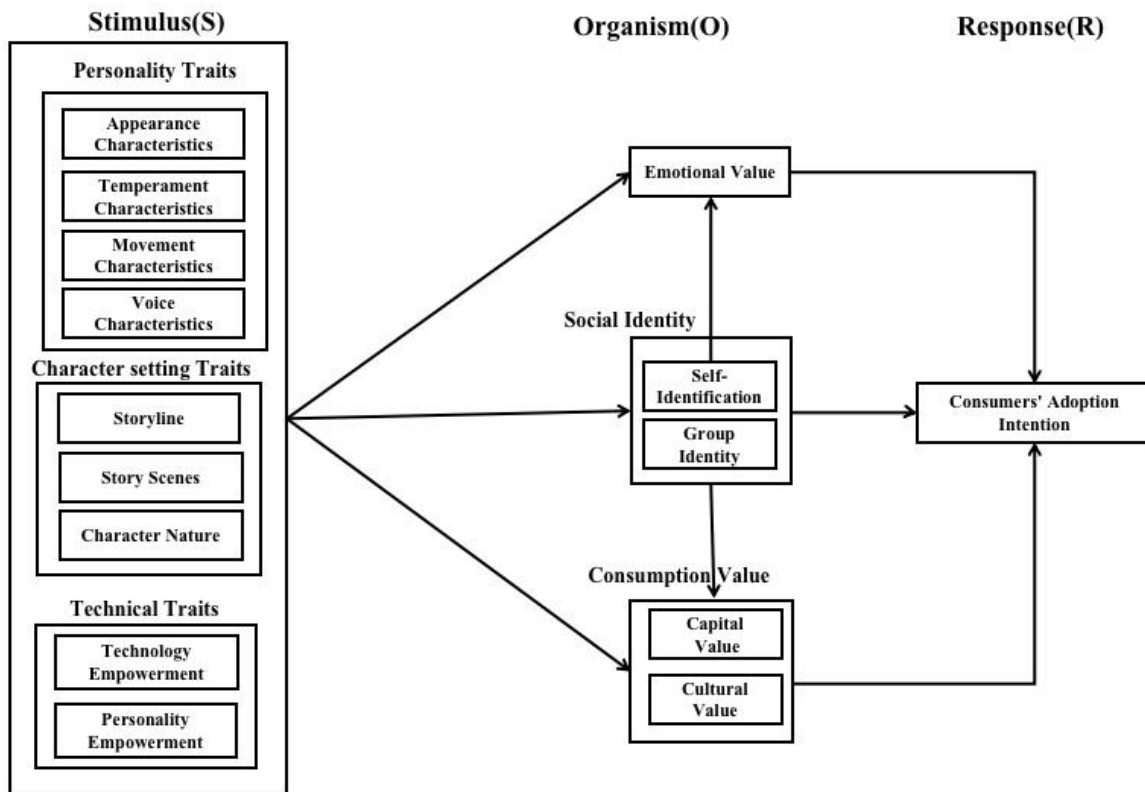


Fig. 1 Theoretical framework

6. Analysis of results

In the study of the perceived characteristics of virtual idols, different research fields and perspectives have suggested different influencing factors, with most researchers focusing more on the development of business models and technologies that support virtual idols [4]. Based on the results of in-depth interviews, appearance characteristics, temperament characteristics, movement characteristics, voice characteristics, storyline, story scenes, character features, technical empowerment, and personality empowerment are proposed based on consumers' real feelings about virtual idols. The perceptual characteristics of virtual idols influence consumer behavior in two ways. Firstly, consumers directly feel the consumption value of virtual idols, as well as the sense of social identity and emotional value they bring. Secondly, consumers first perceive social identity, which then acts on the sense of emotional value and consumption value. Social identity includes self-identity and group identity, while consumption value includes capital value and cultural value. Virtual idols give consumers a good perceptual experience and can inspire consumers' consumption value, which influences consumers' adoption intention virtual idols.

In business practice, enterprises can develop marketing strategies from the elements of virtual idols perceptual characteristics to bring consumers into the scenarios set by virtual idols, so that consumers can generate more positive psychological feelings in the process of contact with them, thus promoting behavioral responses in favor of enterprises. Continuous improvement and innovation based on 9 elements: appearance characteristics, temperament characteristics, movement characteristics, voice characteristics, storyline, story scenes, character features, technical empowerment, and personality empowerment can provide consumers with a good virtual idol contact experience. With the support of technology, the virtual idol appearance image is created more in line with consumers' preferences, so that it has a better personality, more attractive voice and more natural and smooth movements. In this way, consumers have just the right contact experience and desire. The story background, storyline and character features of virtual idols are continuously enriched so that virtual idols can establish a more distinctive and three-dimensional

character image in consumers' minds and increase consumers' emotional investment in virtual idols. Through the investment in relevant technology and the comprehensive quality of the real person behind the virtual idol, the existence form and interaction mode of the virtual idol can be broadened to bring a new interactive experience of the virtual idol and stimulate the freshness of the consumers to the virtual idol. In conclusion, enterprises should improve the overall quality of virtual idols from different experience dimensions to provide consumers with a good experience and promote better experience value for consumers, thus increasing consumer loyalty and improving consumers' adoption intention.

7. Conclusion

This study explored the perceived characteristics of virtual idols and the mechanism of their influence on consumers' adoption intention through in-depth interviews and grounded theory research methods, and obtained the following conclusions.

(1) The perceived characteristics of virtual idols include nine dimensional indicators, which are appearance characteristics, temperament characteristics, movement characteristics, voice characteristics, storyline, story scenes, character features, technical empowerment, and personality empowerment. Among them, appearance characteristics, temperament characteristics, action characteristics, and voice characteristics can be summarized as personality characteristics of virtual idols, storyline, story scenes, and role characteristics can be summarized as character setting traits of virtual idols, and technical empowerment and personality empowerment can be summarized as technical characteristics of virtual idols.

(2) A model of the mechanism of the influence of perceived characteristics of virtual idols on consumers' adoption intention is proposed. The relationship between the elements of perceived characteristics of virtual idols and the influence before consumers' adoption intention is initially clarified to provide a reference for virtual idol marketing by enterprises.

(3) This study adopts a qualitative research method. The elements of the perceived characteristics of virtual idols and their influential relationships with consumers still need to be further explored and verified. In the future, the empirical analysis method can be used to put forward corresponding hypotheses on the relationship between the indicators in the model and develop a category scale to investigate the relationship between the empirical indicators through quantitative research.

8. Acknowledgement

This research was funded by

- [1] Zhao Junzhou, Innovative training program for university students, CS2209007
- [2] Yang Haiyi, Innovative training program for university students, CX2209003
- [3] Ye Xinjie, Innovative training program for university students, CS2309006
- [4] Sun Chao, Innovative training program for university students, CX2309018

Reference

- [1] Sun J, Jin X. The construction of digital subculture and its value-an examination of virtual idol landscape. *Journal of Wuhan University (Philosophy and Social Science Edition)*, 2022, (05): 155-164.
- [2] Chu C. Theoretical examination of virtual idols in the perspective of role model education. *Thought Theory Education*. 2022, (08): 85-90.
- [3] Wang Y, Huang W. On the post-human presentation of "secondary virtual idols". *Future Communication*. 2021, (04): 68-73+121.

- [4] Zhang X. Towards the era of dissipation of the real - discussing the impact of digital reproduction technology on contemporary people with " Hatsune Miku " as an example. *Educational Media Research*. 2016, (05): 70-74.
- [5] Black D. The virtual ideal: virtual idols, cute technology and unclean biology. *Journal of Media & Cultural Studies*, 2008, (05): 37-50.
- [6] Ye D. Virtual idols: hyper-reality, symbolization and aesthetic illusion. *Chinese Literature and Art Review*. 2021, (10): 79-85.
- [7] Yu G, Yang M. Virtual idols: a new communication medium with its own relational properties. *Journalism and Writing*. 2020, (10): 68-73.
- [8] Cheng Z. Exploring the characteristics of high school students' ethnic music cadence perception. Chongqing: Southwest University. 2022, (02).
- [9] Song H. A review of risk perception characteristics of public crisis events. *Psychological Monthly*. 2021, (21): 223-224+227.
- [10] Yu G, Teng W. The " breaking circle " mechanism of virtual idols: an analysis of the three levels of emotions based on the perspective of availability. *Journalism and Writing*, 2021, (04): 63-67.
- [11] Zhang F. Virtual idols in the vortex. *China Brand*, 2022, (07): 45-47.
- [12] Fu X. The encoding of idol symbols: a study of artificial intelligence virtual idol consumption culture. *Learning and Practice*, 2021, (02): 132-140 .
- [13] Le L K. Examining the rise of hatsune Miku: the first international virtual idol. *The UCI Undergraduate Research Journal*, 2014, 1-12.
- [14] Miyake E, I am a virtual girl from Tokyo: virtual influencers, digital-orientalism and the (Im)materiality of race and gender. *Journal of consumer culture*, 2022, 23(1): 209-228.
- [15] Miao F, Kozlenkova I V, Wang Haizhong, et al. An emerging theory of avatar marketing. *Journal of Marketing*, 2022, 86(1):67-90.
- [16] Xing Y, Fan X. Idol worship in the digital age: a perspective on the relationship between brand virtual image and audience. *Contemporary Communication*, 2020, (05): 78-81.
- [17] Fu X. Technological myth and symbolic upgrading: artificial intelligence virtual idols in the context of cultural consumption. *New Theory of Tianfu*, 2021, (02): 150-159.
- [18] Lu Z, Shen C, Li J, et al. More kawaii than a real-person live streamer: understanding how the otaku community engages with and perceives virtual YouTubers. *CHI' 21*, 2021(05): 1-14.
- [19] Glaser B, Strauss A. The discovery of grounded theory: strategies for qualitative research. *American Journal of Sociology*, 1968, 73(6): 773-774.
- [20] Birks D F, Fernandez W, Levina N, et al. Grounded theory method in information systems research: its nature, diversity and opportunities. *European Journal of Information Systems*, 2013, 22(1): 1-8.
- [21] Joy A, Sherry J F, Jr. Speaking of art as embodied imagination: a multisensory approach to understanding aesthetic experience. *Journal of Consumer Research*, 2003, 30(2): 259-282.
- [22] Goulding C. Grounded theory, ethnography and phenomenology: a comparative analysis of three qualitative strategies for marketing research. *European Journal of Marketing*, 2005, 39(3/4): 294-308.
- [23] Wang L, Gao P. Exploring the issue of grounded theory and its application in management research. *Foreign Economics and Management*, 2010, 32(12): 10-18.
- [24] Wang Y, Min Qi, Lin Z. Online review of attitude purchase intention consistency in peer response conflict. *Scientific Research Management*, 2020, 41 (11): 173-181.
- [25] Xu J. The influence of live webcam with goods on college students' purchase intention. *China Business Theory*, 2021, (13): 43-45.