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The Influence Mechanism of Narrative Strategies Used by Virtual Influencers on Consumer Product Preferences

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Abstract: As social media has risen, virtual social media influencers have become a significant tool in modern marketing, utilizing computer-generated images (CGI), machine learning algorithms, and artificial intelligence technologies to connect with consumers via virtual online personas. In this study, the Uses and Gratifications Theory (UGT) is employed as a theoretical framework to explore the effects of educational narrative strategies and evaluative narrative strategies on consumer product preferences, with an analysis of the mediating role of word-of-mouth effectiveness and the moderating role of perceived product usability. It was demonstrated in Experiment 1 that virtual influencers employing educational narrative strategies are more effective than those using evaluative narrative strategies in enhancing consumer product preferences. The boundaries of the study were clarified in Experiment 2, which found that the main effect of educational narrative strategies utilized by social media influencers to increase consumer product preferences is present only in the context of virtual influencers. In Experiment 3, the mediating role of word-of-mouth recommendation effectiveness in the relationship between narrative strategies and consumer product preferences was further verified. The moderating role of perceived product usability was examined in Experiment 4, and it was found that the main effect is more pronounced in contexts where perceived product usability is low. The results of this study provide theoretical and practical guidance on how companies can effectively leverage virtual influencers to promote their products.

Keywords: virtual influencer; narrative strategies; the uses and gratifications theory; product preferences



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1. Introduction

Over the past decade, with the fast development of interactive marketing and social mediate applications, checking the latest updates from Instagrammers and watching new videos from YouTubers has become major leisure activities in many consumers' daily lives [1,2]. Marketing strategies leveraging social media influencers for product promotion have become more prevalent [3–6]. With the development of new digital technologies, virtual social media influencers have emerged as significant modern marketing tools [7–9]. These influencers are virtual personas, possessing digital identities and human-like appearance characteristics, created through computer-generated imagery (CGI), machine learning algorithms, and artificial intelligence technologies [10–12]. Since their inception, these virtual influencers have been highly favored by consumers, thereby significantly increasing the popularity of social media influencers [13,14].

A recent survey revealed that more than half of the respondents followed at least one virtual influencer, and 35% reported purchasing products promoted by virtual influencers [15]. Similar to human social media influencers, virtual influencers establish emotional connections with users by sharing fictional stories that simulate real-life experiences [16,17] and are equally effective in attracting and influencing consumers [17].

However, credibility issues arising from the artificial nature of virtual influencers present significant challenges to their effectiveness in promoting products [11].

Existing research has primarily focused on enhancing the market acceptance of virtual social media influencers. It has been found by researchers that factors such as credibility, attractiveness, expertise, and similarity enhance the influence of virtual social media influencers [10,18]. Recent research shows that increasing emotional interactions in daily communications helps to strengthen the parasocial relationships between consumers and virtual influencers [19,20]. Lou et al. (2023) also found that carefully curated flaws and self-defense strategies can mitigate the uncanny valley effect caused by virtual social media influencers appearing excessively lifelike [21]. However, one of the primary functions of social media influencers is to satisfy consumers' cognitive needs regarding products and brands during their shopping decision-making processes [22]. Despite these insights, few studies have explored how virtual social media influencers satisfy cognitive needs and subsequently positively influence product preferences, particularly through their narrative strategies.

Narrative strategies are methods utilized by social media influencers to construct marketing narratives and describe consumption experiences [23,24]. Traditional social media influencers utilize narrative strategies to enhance their credibility, attractiveness, and usefulness [25,26]. However, there is a scarcity of research focusing specifically on the narrative strategies of virtual social media influencers and their impact on consumer behavior, particularly regarding word-of-mouth effectiveness. This gap is crucial, considering that consumers are increasingly engaged in interactive communication with influencers [27,28]. Contributing to the existing literature and addressing the above research gaps, this study integrates the gratification theory to explore the internal mechanisms and boundary conditions by which the narrative strategies of virtual social media influencers influence consumer product preferences [29]. The aim is to reveal how the narrative strategies (educational and evaluative) employed by virtual social media influencers influence the effectiveness of word-of-mouth, thereby affecting consumer product preferences. This study addresses the existing research gap in the field of virtual social media influencers and consumer behavior, providing practical suggestions for companies in shaping effective narrative strategies.

In response to these research gaps, this study aims to examine how the narrative strategies employed by virtual social media influencers, specifically educational and evaluative narratives, influence consumer product preferences through the lens of Uses and Gratifications Theory. By investigating these internal mechanisms and boundary conditions, the study seeks to provide novel insights into how these strategies potentially enhance the word-of-mouth effectiveness of virtual influencers and shape consumer behavior. This study addresses the existing research gap in the field of virtual social media influencers and consumer behavior, providing practical suggestions for companies in shaping effective narrative strategies.

2. Literature Review and Hypothesis Development

2.1. Virtual Social Media Influencers

Social media influencers (SMIs) are regarded as content creators within social networks who hold "celebrity" status [26,28]. They are perceived as "micro-celebrities" or "non-traditional celebrities" and are regarded as more approachable and credible compared to traditional celebrities [30]. The brand attitudes and purchasing behaviors of young consumers are particularly influenced by SMIs, more so than by traditional celebrities [31].

Virtual social media influencers are virtual personas with digital identities and humanlike appearances created using computer-generated imagery (CGI), machine learning algorithms, and artificial intelligence technologies [10–12]. These virtual influencers are managed on social media by third parties (independent creators, digital agencies, or brands), who define their appearance, personality, and storylines to enhance their influence [32]. Unlike other AI-driven technologies that rely on pre-programmed and scripted responses [7,33,34], most virtual social media influencers remain heavily dependent on their development teams and are not fully autonomous with current technologies [20]. Brands are offered unique advantages by virtual influencers, including greater control over character design and the ability to tailor them to specific target audiences [11].

Unlike human influencers, virtual influencers rarely encounter trouble or cause scandals [12] and possess strong cross-media storytelling capabilities [35]. Consequently, many brands collaborate with virtual influencers to promote products and brand campaigns, aiming to connect with users through these virtual entities on social media [36]. Although studies have found that people can interact with virtual influencers similarly to human influencers [11], the artificial nature of these virtual entities might affect people's expectations of the relationship and the effectiveness of interactions [37]. Existing research primarily focuses on strategies to further enhance the market acceptance of virtual social media influencers. Personal narratives shared by virtual influencers are capable of creating emotional connections and forming parasocial relationships with the audience [38]. Daily emotional interactions are effective in reducing consumers' skepticism and resistance toward content published by virtual influencers [20]. The influence of virtual social media influencers can be enhanced by factors such as credibility, attractiveness, expertise, and similarity [10,18]. However, overly realistic human-like features may lead to the uncanny valley effect among consumers, and carefully curated flaws and self-defense strategies can effectively mitigate this negative impact [21]. Qu and Baek (2024) investigate how consumer attitudes toward virtual influencers in social network marketing are shaped, identifying factors that can enhance or diminish trust in virtual influencers [8]. Key findings indicate that VIs are generally trusted less than HIs, particularly when VIs appear human-like. Furthermore, VIs garner more trust in virtual environments compared to real-world settings and when accompanied by virtual peers rather than human peers. Xin, Hao, and Xie (2024) explore how companies decide between human and virtual influencers for social media marketing. The study finds that firms tend to use human influencers at low scandal risk but shift to virtual ones as the risk increases [39].

Nevertheless, while research has explored the narrative strategies of human social media influencers and compared the effects of different approaches [26], no studies have yet investigated the narrative strategies of virtual influencers. Therefore, this study will focus on examining the narrative strategies of virtual influencers.

2.2. Narrative Strategies of Virtual Influencers

Narrative strategies employed by human SMIs are methods utilized to construct marketing narratives and describe consumption experiences [23,24]. When creating electronic word-of-mouth (eWOM) content, various methods such as language, tone, technique, symbols, and materials are employed by influencers to introduce brands and products while also linking these to their identity, inner thoughts, emotions, concepts, cultural background, economic and social status, and social roles [26]. The narrative strategies of SMIs can be categorized into two dimensions: SMI attribution (emotional–cognitive) and the Variation of Brand Meanings Introduced in SMIs' eWOM [26].

This study focuses on the cognitive dimension of attribution in virtual influencers, with specific emphasis on the narrative strategies of education and evaluation. Both strategies serve the same purpose—enhancing consumers' cognitive awareness of the brand/product—but differ significantly in their implementation and focus within the dimension of Variation of Brand Meanings Introduced in SMIs' eWOM. Education primarily conveys standardized meanings to consumers, while evaluation introduces localized meanings, demonstrating notable differences in approach and emphasis [26].

The educational narrative strategy is centered on conveying in-depth knowledge about the brand and product to consumers, utilizing logic and evidence to support recommendations. It tends to present standardized meanings created by the brand [40], thereby aiding consumers in understanding product features and brand value from a cognitive perspective [41]. This strategy enhances the credibility of word-of-mouth by providing

objective guidance and solutions, encouraging consumers to establish connections with the brand based on rational cognition [26].

The evaluative narrative strategy, by contrast, attracts consumers through the sharing of the virtual influencer's personal experiences and subjective evaluations, emphasizing personalized meanings derived from product experiences. This strategy involves influencers' assessments of the actual performance, value, and contribution of brands and products from various perspectives [42]. The evaluative narrative strategy is closely tied to the cultural background of the target market and consumers' personal preferences, relying more heavily on the influencer's credibility and the authenticity of their experiences. This strategy employs emotional resonance and personal stories to promote consumers' brand identification [26].

Although both educational and evaluative narrative strategies aim to enhance brand influence, the educational narrative strategy places greater emphasis on the authority and accuracy of information, whereas the evaluative narrative strategy prioritizes personalized expression and emotional interaction.

2.3. Uses and Gratifications Theory

Uses and Gratifications Theory (UGT or U&G Theory) provides a comprehensive framework for examining not only the motivations behind individuals' media usage but also the specific gratifications they seek and obtain through such interactions [43]. Traditionally applied across diverse media, the theory extends to various media contexts, recognizing consumers as active agents who purposefully select media and content to satisfy specific psychological and social needs [43]. In the digital landscape, particularly with virtual social media influencers, UGT serves as a useful lens through which we can analyze how these entities fulfill particular needs for knowledge, entertainment, and social interaction in ways distinct from traditional media [44]. Virtual influencers, unlike their human counterparts, bring unique cognitive and emotional dimensions into focus. UGT highlights that consumers actively engage with media, including virtual influencers, to fulfill their personal and social needs and desires. While consumers select content based on personal desires, virtual influencers fulfill specific cognitive needs for information and social validation in virtual contexts [45].

In exploring this, Yaman and ÇAKIN (2021) found that Generation Z consumers view one of the primary functions of social media influencers as meeting their cognitive needs for purchasing decisions [22]. Through the lens of UGT, these behaviors link the cognitive motivations for seeking media content—such as informational reinforcement and decision-making guidance—with the digital strategies employed by virtual influencers. Prior to forming an attitude toward a product or service, consumers heavily rely on the knowledge, feelings, and experiences of social media influencers and are significantly influenced by their discourse [22].

Virtual influencers, devoid of genuine subjective experiences yet crafted through sophisticated digital technologies, create a distinct interaction model. This digital nature alters consumer perceptions, highlighting the cognitive over emotional gratifications. Consumers perceive virtual influencers as more artificial, prioritizing cognitive over emotional needs, such as the desire for detailed product knowledge versus empathetic engagement [20]. As a result, when consumers choose virtual influencers to fulfill their purchasing decision needs, their cognitive need for functional knowledge outweighs the emotional need for subjective experience. Unlike real social media influencers, consumers may trust those who are highly specialized in a particular area while remaining skeptical of the knowledge shared by real influencers outside their expertise [46]. However, people are generally more willing to accept the emotional content communicated by real influencers, even if their feelings ultimately differ. On the other hand, when it comes to virtual influencers, people are unlikely to doubt the accuracy of the information provided. Virtual influencers are perceived more like specialized search engines or other instrumental entities programmed to deliver standardized, error-free answers. They are perceived to be as credible as human

influencers when they use rational endorsement language [47]. However, people may question the emotions they describe, as virtual influencers cannot genuinely experience real-world products. Based on this, we propose that while virtual and real influencers may appear strikingly similar, their fundamental differences lead consumers to have entirely different needs and uses for them.

Electronic word-of-mouth (eWOM) refers to any positive or negative opinions and information related to products and brands disseminated by consumers via the Internet [48]. The narrative content of virtual social media influencers, a significant form of eWOM recommendation, satisfies consumers' cognitive needs regarding products or brands. Existing research empirically confirms the crucial role of source credibility in the effectiveness of eWOM [49]. Credible word-of-mouth can reduce consumers' perceived risk, thereby influencing their purchasing decisions [50]. When educational narrative strategies are employed by virtual influencers, consumers gain in-depth knowledge about brands and products, leading to a better understanding of product features and brand value from a cognitive perspective [41].

UGT provides a theoretical basis for explaining that in this context, virtual influencers effectively meet consumers' informational and cognitive needs for purchasing decisions, leading to high eWOM recommendation effectiveness. eWOM can facilitate interpersonal influence, leading to shifts in consumers' perceptions, thoughts, attitudes, and behaviors [51,52]. In consequence, effective word-of-mouth further increases product preferences for items recommended by virtual influencers. This theoretical framework helps us interpret how UGT aligns with narrative strategy use, as it indicates a preference for content that fulfills specific cognitive gratifications. In comparison to educational narrative strategies, evaluative narrative strategies emphasize personalized expression and emotional experience, placing less emphasis on logic and authoritative knowledge [42], and therefore, cannot effectively meet consumers' cognitive needs for products or brands. Furthermore, as virtual influencers are digital avatars created by CGI and machine learning algorithms and lack genuine sensory and subjective experiences [20], consumers may doubt the authenticity of their evaluative narratives [53]. This skepticism can lead to significant negative attributions toward their content [20,54], thereby rendering eWOM ineffective. UGT aids in interpreting these findings by emphasizing that cognitive fulfillment through educational narrative strategies is key to influencing consumer behavior. Based on the preceding analysis, the following hypotheses are proposed in this study:

H1: Virtual influencers employing educational narrative strategies, as opposed to evaluative narrative strategies, have a positive influence on consumers' product preferences.

H2: The effectiveness of electronic word-of-mouth (eWOM) mediates the relationship between virtual influencers' narrative strategies and consumers' product preferences.

2.4. The Moderating Effect of Perceived Product Ease of Use

Perceived product ease of use is defined as the degree to which consumers find a product effortless to use [55,56]. When perceived ease of use is high, consumers perceive the product as easy to use, requiring minimal effort. Conversely, when perceived ease of use is low, consumers perceive the product as requiring significant effort [55,56]. Effort is viewed as a limited resource that individuals allocate to various tasks, prompting them to find ways to minimize its use across activities [57].

In this study, perceived ease of use (high vs. low) is proposed to effectively moderate the relationship between virtual influencer narrative strategies and consumer product preferences. Specifically, the perceived ease of use of a product influences consumers' allocation of cognitive resources. When perceived ease of use is low, consumers perceive the product as difficult to use, increasing their reliance on media to overcome this challenge [58].

At this point, virtual influencers employing educational narrative strategies offer more product information, fulfilling consumers' cognitive needs and, thereby, enhancing their product preferences [40,41]. When perceived ease of use is high, consumers view the

product as easy to use, resulting in a reduced cognitive need to seek media for assistance [22]. Consequently, the differential impact of educational versus evaluative narrative strategies employed by virtual influencers on consumer product preferences will diminish, rendering the main effect insignificant.

Based on these considerations, this study proposes the following hypothesis:

H3: *Perceived ease of use moderates the relationship between virtual influencer narrative strategies and consumer product preferences.*

H3a: When perceived ease of use is low, the positive impact of virtual influencers employing educational narrative strategies, as opposed to evaluative narrative strategies, on consumer product preferences is more pronounced.

H3b: When perceived ease of use is high, the differential impact of virtual influencer narrative strategies (educational vs. evaluative) on consumer product preferences diminishes and becomes insignificant.

3. Overview of Experiments

The hypotheses are tested across four experiments, each building upon the previous to comprehensively explore the influence of narrative strategies used by influencers. Experiment 1 aims to establish the main effect by demonstrating that virtual influencers who employ educational narrative strategies are more effective in enhancing consumer product preferences compared to those using evaluative strategies. This provides the foundation for our investigation. Experiment 2 is designed to compare real influencers to virtual ones, examining whether the main effect is unique to virtual influencers. The findings indicate that, unlike virtual influencers, human influencers show no significant difference between educational and evaluative strategies in affecting consumer preferences. Experiment 3 extends the understanding by refining the causal chain, identifying the mediating role of word-ofmouth effectiveness in how virtual influencers' narrative strategies influence consumer product preferences. Finally, Experiment 4 investigates the moderating role of perceived product ease of use. It reveals that when ease of use is perceived as low, the positive effect of educational narrative strategies is significantly more pronounced. However, when ease of use is high, the narrative strategy type has little effect on consumer preferences. Together, these experiments form a cohesive analysis demonstrating the specific conditions under which virtual influencers impact consumer behavior.

3.1. Experiment 1

Experiment 1 was conducted to investigate H1, which posits that virtual influencers who employ educational narrative strategies are more likely to increase consumer product preferences compared to those using evaluative narrative strategies.

3.1.1. Participants

Based on the calculation method outlined by Cohen (1977) and the effect size (f = 0.25) and power value (0.80) commonly used in related studies, G*Power 3.1 was utilized to calculate a planned sample size of more than 128 participants. Consequently, 150 participants were recruited from a university to complete a series of surveys regarding a new brand of athletic shoes in Experiment 1. Participants were randomly assigned to two groups (education/evaluation), yielding a total sample size of N = 137 (ages 18–29, M = 22.46, SD = 2.20), with 45.26% female participants. The sample sizes for each group were as follows: $n_{\rm education} = 69$, $n_{\rm evaluative} = 68$.

3.1.2. Method

A virtual social media influencer named "April" was created to introduce consumers to product information about the new athletic shoes from the Bbestt brand. To ensure the effectiveness of the narrative strategy manipulation, 63 participants (ages 19-27, M = 22.05,

SD = 1.78, 42.86% female) were recruited online and randomly assigned to two groups (educational/evaluative) for a pre-test.

Participants were first informed that this was a highly popular virtual social media influencer. They were then shown posts related to the new athletic shoe product information pertinent to their group. The post for the educational narrative strategy group read as follows:

"Hi, friends! I'm your April! Today, I want to introduce you to an exciting product—the new Bbestt athletic shoes. As a leading creator of athletic shoes, Bbestt has always focused on high quality and innovation. These new athletic shoes perfectly embody Bbestt's philosophy. They use the latest nanotechnology materials and techniques, providing excellent support and cushioning, giving wearers a light and flexible feel and stable support during exercise. Additionally, these shoes are highly durable and adaptable. Their wear-resistant rubber outsole ensures optimal grip and anti-slip performance on different surfaces, and the mesh design of the upper provides good breathability, keeping feet dry and comfortable during exercise. Overall, these new athletic shoes combine the latest technology with perfect design. You deserve them!"

The post for the evaluative narrative strategy group was written as follows:

"Hi, friends! I'm your April! Today, I want to share my experience wearing the latest Bbestt athletic shoes with you! As a leading creator of athletic shoes, Bbestt has always impressed me with their meticulous production of sports products. I was initially attracted by the design of these shoes. The first feeling of wearing them is lightness and comfort, providing excellent support for my feet, supposedly due to their advanced nanotechnology. They are very light and flexible for both sports and dancing, with excellent shock absorption. Furthermore, these shoes are highly adaptable, with a very wear-resistant rubber outsole that ensures great grip and anti-slip performance whether for running in the sun or walking lightly after the rain. Even with long wear, the mesh design of the upper keeps my feet dry and comfortable. After using them for some time, I find them very durable. These athletic shoes are a combination of the latest technology and perfect design. I sincerely recommend them to you!"

Participants were subsequently asked to rate the educational level of the virtual influencer's narrative strategy: "The influencer's statements enhanced my knowledge and understanding of the brand and product". "The influencer logically explained the product or brand meaning through professional knowledge and deep insights". (7-point scale, 1 = strongly disagree, 7 = strongly agree) [26].

They were also instructed to rate the evaluative level of the virtual influencer's narrative strategy: "The influencer's statements revealed the actual performance, value, and contribution of the product during and after use". "The influencer shared consumers' experiences with the product and their evaluations after using it". (7-point scale, 1 = strongly disagree, 7 = strongly agree) [26]. The results indicated that the educational group scored significantly higher in the education narrative strategy rating compared to the evaluative group ($M_{\text{educational}} = 4.47$, SD = 0.56; $M_{\text{evaluative}} = 3.22$, SD = 0.72, t = 7.68, df = 61, p < 0.001, d = 1.938). The evaluative group scored significantly higher in the evaluative narrative strategy rating compared to the educational group ($M_{\text{evaluation}} = 4.34$, SD = 0.61; $M_{\text{education}} = 2.94$, SD = 0.69, t = 8.55, df = 61, p < 0.001, d = 2.150), confirming the effectiveness of the narrative strategy manipulation in Experiment 1.

Subsequently, in the main experiment, participants were informed that the purpose of the activity was to investigate consumer attitudes toward the new Bbestt brand athletic shoes, and they were asked to evaluate carefully. Participants in each group (educational group/evaluative group) were exposed to posts by the virtual social media influencer "April" to obtain product information. Previous research has indicated that psychological distance and the amount of word-of-mouth significantly affect the effectiveness of word-of-mouth recommendations [59,60]. To control for this influence, all participants were informed that this was the first post they had encountered regarding the new brand

product and were instructed to evaluate it from a bystander's perspective [61,62]. Participants were then asked to report their preference for the product: "I think the product recommended by the virtual influencer is good". "I have a favorable impression of the product recommended by the virtual influencer". "I like the product recommended by the virtual influencer" (7-point scale: 1 = strongly disagree, 7 = strongly agree) [63], along with other potential confounding factors, such as personal interests and shopping experiences. Finally, participants' emotional states were assessed using an affective dimension scale [64]. They were also asked to report psychological distance [59], evaluate product quality [65], assess perceived word-of-mouth volume [60], evaluate the virtual influencer's narrative strategy (educational/evaluative), indicate whether preference depends on past shopping experiences, and speculate on the purpose of the survey.

3.1.3. Result and Discussion

Manipulation Check: Six participants relied on past experiences, and seven participants correctly guessed the true purpose of the survey. The data of these participants were excluded. Participants in the education group scored significantly higher on the educational level of the narrative strategy than those in the evaluation group ($M_{\rm educational} = 4.59$, SD = 0.81; $M_{\rm evaluative} = 3.11$, SD = 0.56, t = 12.51, df = 135, p < 0.001, d = 2.125). Participants in the evaluation group scored significantly higher on the evaluative level of the narrative strategy than those in the education group ($M_{\rm educational} = 4.38$, SD = 0.63; $M_{\rm evaluative} = 3.16$, SD = 0.71, t = 10.55, df = 135, p < 0.001, d = 1.818), indicating that the manipulation effectively influenced most participants.

Product Preference: The results revealed a significant difference in product preference as promoted by the virtual influencer between the two groups. Participants in the education group exhibited significantly higher product preference than those in the evaluation group ($M_{\rm educational} = 4.22$, SD = 1.06; $M_{\rm evaluative} = 3.60$, SD = 0.95, t = 3.58, df = 135, p < 0.001, d = 0.616), supporting H1.

Control Variables: No significant differences were observed in the emotional states of participants between the two groups ($M_{\rm educational} = 3.94$, SD = 0.98; $M_{\rm evaluative} = 4.01$, SD = 0.89, t = 0.45, df = 135, p = 0.651, d = -0.075). No significant differences in psychological distance were observed between the two groups ($M_{\rm educational} = 4.26$, SD = 0.85; $M_{\rm evaluative} = 4.31$, SD = 0.85, t = 0.33, df = 135, p = 0.742, d = -0.0588). No significant differences in perceived product quality were observed between the two groups ($M_{\rm educational} = 4.35$, SD = 0.97; $M_{\rm evaluative} = 4.31$, SD = 0.97, t = 0.24, df = 135, p = 0.814, d = -0.059). No significant differences in the evaluation of the amount of word-of-mouth were observed between the two groups ($M_{\rm educational} = 2.88$, SD = 0.76; $M_{\rm evaluative} = 2.94$, SD = 0.79, t = 0.43, df = 135, p = 0.666, d = -0.077). Therefore, these factors were ruled out as potential confounding variables affecting the experimental results.

The data from Experiment 1 confirmed H1, indicating that consumer product preference is effectively enhanced by virtual influencers employing educational narrative strategies. To further delineate the boundaries of this main effect, Experiment 2 was conducted to determine whether the main effect observed in this study is exclusive to virtual influencers.

3.2. Experiment 2

Experiment 2 aimed to delineate the boundaries of this study, specifically to determine whether the main effect, whereby social media influencers employing educational narrative strategies enhance consumer product preference more effectively than evaluative narrative strategies, is exclusive to the context of virtual influencers.

3.2.1. Participants

Based on the calculation method used by Cohen (1977) and the effect size (f = 0.25) adopted in related studies with an expected power value (Power = 0.80), the planned sample size was calculated using G*Power 3.1 software, resulting in a minimum of 179 par-

ticipants. Consequently, for Experiment 3, researchers recruited 210 participants from a university to complete a series of surveys regarding a new FOXX brand massage device. Participants were randomly assigned to a 2 (educational narrative strategy/evaluative narrative strategy) \times 2 (virtual influencer/human influencer) experimental design, resulting in a final total sample of (N=195, ages 19-37, M=26.63, SD=3.80, with 48.21% female), with group sample sizes as follows: ($n_{\rm educational,\,virtual}=50$, $n_{\rm educational,\,human}=48$, $n_{\rm evaluative,\,virtual}=48$, $n_{\rm evaluative,\,human}=49$).

3.2.2. Method

The researchers created a social media influencer named "April" to introduce new product information from the FOXX brand to consumers. To ensure the validity of the social media influencer types (virtual/human), the researchers recruited 62 participants online (age 21–34 years, M = 26.42, SD = 3.19, with 41.94% female), who were randomly assigned to two groups (virtual/real) for a pretest. Participants in the virtual influencer group were given the following information to read:

"April is a virtual influencer born in the digital world. Although not a real person, April's unique personality and charm have enabled her to form deep emotional connections with 500,000 fans from various age groups and backgrounds. April shares fashion insights and lifestyle attitudes with them across major platforms."

Participants in the real influencer group were given the following information to read:

"April is a real influencer active on various social media platforms. Her unique personality and charm have garnered her more than 500,000 loyal fans from different age groups and backgrounds. She has built deep emotional connections with her fans, sharing fashion insights and lifestyle attitudes across major platforms."

Participants in the two groups were then asked to evaluate the type of social media influencer (on a 7-point scale: 1 = virtual influencer, 7 = human influencer). The results indicated that the human influencer group rated the influencer type significantly higher than the virtual influencer group ($M_{\text{-human}} = 5.26$, SD = 1.00; $M_{\text{-virtual}} = 2.13$, SD = 0.72, t = 14.16, df = 60, p < 0.001, d = 3.59), confirming the validity of the influencer type manipulation in Experiment 2.

Subsequently, to ensure the validity of the narrative strategy manipulation, the researchers recruited 65 participants online (ages 22–39, M = 27.35, SD = 4.08, with 41.54% female), who were randomly assigned to two groups (educational narrative strategy group/evaluative narrative strategy group) for a pretest.

The educational narrative strategy group received the following information:

"Hi! I am April, and today I want to take you through a revolutionary product—the new FOXX brand massager. The FOXX massager employs advanced deep tissue massage technology, precisely targeting deep muscle layers to relieve tension and fatigue. Its built-in smart sensor monitors and adjusts the pressure in real-time, ensuring every massage is both safe and effective. According to the latest research, regular use of this massager can significantly improve blood circulation, reduce muscle soreness, and even aid in improving sleep quality. The FOXX massager is ergonomically designed to ensure comfort while providing deep massages. It comes with multiple modes and intensity settings to meet various needs. Whether for daily relaxation or post-exercise recovery, the FOXX massager offers personalized solutions."

The evaluative narrative strategy group received the following information:

"Hi! I am April, and today I want to share with you a new essential in my life—the FOXX brand's new massager. Since I started using the FOXX massager, it has become an indispensable part of my daily life. Its deep tissue massage technology allows me to feel deep muscle relaxation with every use, as if a professional masseur is working on me. After each massage, I feel both physically and mentally refreshed. The built-in smart sensor has left a strong impression on me. It monitors and adjusts the pressure in

real-time, ensuring the massage is safe and effective. The ergonomic design also makes the FOXX massager comfortable to use. Whether on the couch at home or in the office chair, I can enjoy a high-quality massage. After regularly using the FOXX massager, my sleep quality has significantly improved. Whether for daily relaxation or post-exercise recovery, I can set the mode and intensity according to my needs, making it perfect for creating a personalized massage experience."

Participants were then asked to evaluate the educational and evaluative aspects of the narrative strategy used by the virtual influencer. The results showed that the educational narrative strategy group rated the educational aspect significantly higher than the evaluative narrative strategy group ($M_{\rm educational} = 4.30$, SD = 0.68; $M_{\rm evaluative} = 2.91$, SD = 0.55, t = 9.09, df = 63, p < 0.001, d = 2.25). Conversely, the evaluative narrative strategy group rated the evaluative aspect significantly higher than the educational narrative strategy group ($M_{\rm educational} = 3.06$, SD = 0.67; $M_{\rm evaluative} = 4.52$, SD = 0.56, t = 9.48, df = 63, p < 0.001, d = -2.36), confirming the validity of the narrative strategy manipulation in Experiment 2.

In the main experiment, participants were informed that the purpose of the activity was to investigate consumers' attitudes toward new products. They were instructed to evaluate carefully and cautiously and were introduced to April as a highly popular social media influencer. For participants in the real influencer group, information about the real influencer was provided first; for participants in the virtual influencer group, information about the virtual influencer was provided. In terms of narrative strategy manipulation, educational narrative strategy posts were provided to participants in the educational group, while evaluative narrative strategy posts were given to participants in the evaluative group. To control for the influence of the number of word-of-mouth recommendations and psychological distance, all participants were informed that this was the first recommendation post they had seen and were asked to evaluate from an observer's perspective [61,62]. Participants were then asked to report their perceptions of the effectiveness of the influencer's word-of-mouth [66], their preference for the product [63], as well as other confounding items such as personal interests, shopping experiences, etc. Finally, participants' emotional states were measured using the emotional dimension scale [64]. They were also asked to report psychological distance [59], product quality evaluation [65], perceived number of word-of-mouth recommendations [60], the type of narrative strategy used by the virtual influencer, whether preferences relied on past shopping experiences, and to guess the purpose of this survey.

3.2.3. Result and Discussion

Manipulation Check: Thirteen participants relied on past experiences, and two participants correctly guessed the true purpose of the survey. The data of these participants was excluded. Participants in the educational group rated the educational narrative strategy significantly higher than those in the evaluative group ($M_{\rm educational}=4.32$, SD=0.65; $M_{\rm evaluative}=2.79$, SD=0.59; t=17.17, df=193, p<0.001, d=2.46). Participants in the evaluative group rated the evaluative narrative strategy significantly higher than those in the educational group ($M_{\rm educational}=2.72$, SD=0.63; $M_{\rm evaluative}=4.27$, SD=0.65; t=16.89, df=193, p<0.001, d=-2.42). Participants in the virtual influencer group rated the influencer type significantly lower than those in the human influencer group ($M_{\rm virtual}=2.22$, SD=0.78; $M_{\rm human}=5.32$, SD=0.85; t=26.52, df=193, p<0.001, d=-3.80). The manipulation effectively influenced the majority of participants.

Word-of-mouth effectiveness: The results indicated that the interaction between narrative strategy (educational/evaluative) and influencer type (virtual/human) significantly affected the effectiveness of word-of-mouth recommendations (F = 8.12, p < 0.05). In the virtual influencer context, the effectiveness of word-of-mouth recommendations was significantly higher in the educational narrative strategy group than in the evaluative narrative strategy group ($M_{\rm educational} = 4.16$, SD = 0.91; $M_{\rm evaluative} = 3.58$, SD = 1.05; t = 2.91, df = 96, p < 0.05, d = 0.59). In the human influencer context, no significant difference in word-of-

mouth effectiveness was found between the two groups ($M_{\text{evaluative}} = 4.16$, SD = 0.90; $M_{\text{educational}} = 3.96$, SD = 0.97; t = 1.08, df = 95, p = 0.282, d = 0.21).

Product preference: The results showed that the interaction between narrative strategy (educational/evaluative) and influencer type (virtual/human) significantly influenced product preference (F=4.79, p<0.05). In the virtual influencer context, product preference was significantly higher in the educational narrative strategy group than in the evaluative narrative strategy group ($M_{\rm educational}=4.14$, SD=0.81; $M_{\rm evaluative}=3.50$, SD=1.13; t=3.24, df=96, p<0.05, d=0.65). In the human influencer context, no significant difference in product preference was observed between the two groups ($M_{\rm evaluative}=4.08$, SD=0.91; $M_{\rm educational}=4.13$, SD=0.94; t=0.23, df=95, p<0.05, d=-0.05).

Moderated mediation analysis: This study employed bootstrapping (using PROCESS Model 8; Hayes, 2013) to examine the moderated mediation effect of influencer type (virtual influencer, human influencer). The results indicated that the interaction between narrative strategy (educational/evaluative) and influencer type (virtual influencer, human influencer) significantly influenced the effectiveness of word-of-mouth recommendations (95% confidence interval $\beta = 0.78$; CI [0.24, 1.32]). Additionally, the effectiveness of word-ofmouth recommendations significantly influenced individuals' product preferences (95% confidence interval $\beta = 0.85$; CI [0.78, 0.93]). In the virtual influencer context, the type of narrative strategy significantly influenced product preference through the effectiveness of word-of-mouth recommendations (Conditional Indirect Effect, 95% confidence interval $\beta = 0.49$; CI [0.15, 0.84]). In the human influencer context, the indirect effect of the influencer's narrative strategy on product preference was not significant (Conditional Indirect Effect, 95% confidence interval $\beta = -0.18$; CI [-0.51, 0.14]). In summary, influencer type (virtual influencer, human influencer) effectively moderated the relationship between the virtual influencer's narrative strategy and consumers' product preferences through the effectiveness of word-of-mouth recommendations (95% confidence interval β = 0.67; CI [0.19, 1.15]).

Control variables: There were no significant differences in emotional state among the four groups (F(3, 191) = 0.22, p = 0.884; $M_{\rm educational,\,virtual} = 3.94$, SD = 0.77; $M_{\rm educational,\,human} = 3.88$, SD = 0.87; $M_{\rm evaluative,\,virtual} = 4.00$, SD = 1.13; $M_{\rm evaluative,\,human} = 3.86$, SD = 1.08). There were no significant differences in psychological distance among the four groups (F(3, 191) = 0.20, p = 0.898; $M_{\rm educational,\,virtual} = 4.50$, SD = 0.84; $M_{\rm educational,\,human} = 4.46$, SD = 0.92; $M_{\rm evaluative,\,virtual} = 4.42$, SD = 0.87; $M_{\rm evaluative,\,human} = 4.37$, SD = 0.95). There were no significant differences in perceived product quality among the four groups (F(3, 191) = 0.25, p = 0.862; $M_{\rm educational,\,virtual} = 4.48$, SD = 0.95; $M_{\rm evaluative,\,human} = 4.59$, SD = 1.00). There were no significant differences in the evaluation of the number of word-of-mouth recommendations among the four groups (F(3, 191) = 0.29, p = 0.831; $M_{\rm educational,\,virtual} = 2.50$, SD = 0.97; $M_{\rm educational,\,human} = 2.38$, SD = 0.91; $M_{\rm educational,\,virtual} = 2.33$, SD = 0.88; $M_{\rm evaluative,\,human} = 2.43$, SD = 0.96). Therefore, potential interference from these factors on the experimental results was ruled out.

Experiment 2 delineated the boundary of the main effect, indicating that the primary effect of social media influencers using educational narrative strategies over evaluative narrative strategies in enhancing consumer product preference exists only in the virtual influencer context.

3.3. Experiment 3

Experiment 3 is designed to examine H2, which hypothesizes that the effectiveness of word-of-mouth mediates the relationship between virtual influencer narrative strategies (educational, evaluative) and consumer product preference.

3.3.1. Participants

Using the calculation method from Cohen (1977), along with an effect size of f = 0.25 and a desired power value of 0.80 as used in related studies, G*Power 3.1 software deter-

mined that a sample size of over 128 participants was needed. Consequently, 150 participants were recruited from a university in Experiment 3 to complete a series of surveys related to thermal cup products. Participants were randomly assigned to two groups (educational narrative strategy/evaluative narrative strategy), resulting in a total sample size of N=135 (ages 18–28, M=22.36, SD=2.06, with 49.63% female participants). The sample sizes were $n_{\rm educational}=67$ and $n_{\rm evaluative}=68$, respectively.

3.3.2. Method

A virtual social media influencer named "April" was created to introduce consumers to the new thermal cup product information of the EDA brand. To ensure the effectiveness of the narrative strategy manipulation, 65 participants were recruited online (ages 18–29, M = 22.18, SD = 2.17, with 40% female participants) and randomly assigned to two groups (educational/evaluative) for a pre-test.

Initially, participants were informed that the virtual social media influencer was highly popular. Subsequently, each participant group received posts related to the thermal cup product information. The post provided to the education group stated:

"Hello! I'm April! Today, I'm excited to share an innovative discovery—the new thermal cup from the EDA brand. This product is not merely a container but a fusion of technology and design. EDA has crafted this thermal cup with a simple yet classic aesthetic, featuring a matte finish that enhances the bottle's texture, in the top three colors popular among online users. The advanced vacuum insulation technology keeps beverages at their original temperature for up to 10 h in any environment. Its ergonomic design ensures a comfortable grip for all users. The lid's patented sealing technology, made with the latest silicone, guarantees no spills, making it convenient for various occasions. Every detail reflects EDA's dedication to perfecting detail and user experience, which is why I highly recommend this product."

The post provided to the evaluation group stated:

"Hello! I'm April! Today, I want to share my personal experience—my thoughts on the new EDA brand thermal cup. Initially, I chose this cup for its stylish appearance. When I received it, its matte texture and popular colors matched my taste, and the simple, classic design was very appealing. However, what truly impressed me was its remarkable insulation capability, enabled by advanced vacuum insulation technology, which kept my beverages warm for up to 10 h. On rainy days, I made hot coffee, and it stayed warm all day! Additionally, the bottle is comfortable to hold, and the lid, with its patented sealing design, does not leak regardless of how it's handled, making it very convenient to carry. EDA's attention to detail and focus on user experience is truly impressive, and I highly recommend this product."

Participants were subsequently asked to evaluate the type of narrative strategy employed by the virtual influencer. The results indicated that the educational narrative strategy group scored significantly higher on the educational level of the narrative strategy compared to the evaluation narrative strategy group ($M_{\rm educational} = 4.30$, SD = 0.68; $M_{\rm evaluative} = 3.03$, SD = 0.49, t = 8.59, df = 63, p < 0.001, d = 2.143). Similarly, the evaluative narrative strategy group scored significantly higher on the evaluative level of the narrative strategy compared to the educational narrative strategy group ($M_{\rm evaluative} = 4.52$, SD = 0.56; $M_{\rm educational} = 3.06$, SD = 0.67, t = 9.48, df = 63, p < 0.001, d = 2.365), confirming the effectiveness of the narrative strategy manipulation in Experiment 3.

Subsequently, in the main experiment, participants were informed that the activity aimed to investigate consumer attitudes toward the new product, and they were asked to evaluate it carefully. Each group of participants (education group/evaluation group) was informed that the post originated from a highly popular virtual social media influencer named "April". To control for the influence of the amount of word-of-mouth and psychological distance, participants were informed that this was the first recommendation post they had encountered and were instructed to evaluate it from a bystander's perspective [61,62].

Participants were then asked to report their perceived effectiveness of the virtual influencer's word-of-mouth, using statements such as "I think the word-of-mouth about the product posted by the virtual influencer is genuine", "I think the word-of-mouth about the product posted by the virtual influencer is accurate", and "I think the word-of-mouth about the product posted by the virtual influencer is credible" (7-point scale, 1 = strongly disagree, 7 = strongly agree) [66]. Additionally, they were asked to report their product preference [63] and other potentially confounding factors, such as personal interests and shopping experiences.

Finally, participants' emotional states were assessed using an affective dimension scale [64]. They were also asked to report their psychological distance [59], evaluate product quality [65], and indicate the perceived profundity of word-of-mouth [60]. Additionally, participants evaluated the type of virtual influencer narrative strategy, determined whether their preference depended on past shopping experiences, and attempted to guess the purpose of the survey.

3.3.3. Result and Discussion

Manipulation Check: Ten participants relied on past experiences, and five participants correctly guessed the true purpose of the survey. The data on these participants were excluded. Participants in the educational group scored significantly higher on the educational dimension of the narrative strategy compared to those in the evaluation group ($M_{\rm educational} = 4.57$, SD = 0.72; $M_{\rm evaluative} = 2.99$, SD = 0.67, t = 13.15, df = 133, p < 0.001, d = 2.272). Participants in the evaluation group scored significantly higher on the evaluative dimension of the narrative strategy compared to those in the educational group ($M_{\rm evaluative} = 4.28$, SD = 0.69; $M_{\rm educational} = 2.96$, SD = 0.57, t = 12.01, df = 133, p < 0.001, d = 2.086), indicating that the manipulation was effective for the majority of participants.

Effectiveness of Word-of-Mouth: The results indicated a significant difference in the effectiveness of word-of-mouth provided by the virtual influencer between the two groups. The effectiveness of word-of-mouth for participants in the educational narrative strategy group was significantly greater than for those in the evaluative narrative strategy group ($M_{\rm educational} = 3.78$, SD = 0.85; $M_{\rm evaluative} = 3.40$, SD = 1.04, t = 2.32, df = 133, p < 0.05, d = 0.400).

Product Preference: The results indicated a significant difference in product preference influenced by the virtual influencer between the two groups. Participants in the educational narrative strategy group demonstrated significantly greater product preference compared to those in the evaluative narrative strategy group ($M_{\rm educational} = 4.12$, SD = 0.90; $M_{\rm evaluative} = 3.57$, SD = 1.14, t = 3.09, df = 133, p < 0.05, d = 0.536).

Control Variables: No significant differences were observed in the emotional states of participants between the two groups ($M_{\rm educational}=3.67$, SD=0.88; $M_{\rm evaluative}=3.74$, SD=0.92, t=0.41, df=133, p=0.682, d=-0.078). No significant differences were observed in psychological distance between the two groups ($M_{\rm educational}=4.00$, SD=0.94; $M_{\rm evaluative}=4.18$, SD=0.95, t=1.09, df=133, p=0.278, d=-0.190). No significant differences were found in perceived product quality between the two groups ($M_{\rm educational}=4.49$, SD=0.91; $M_{\rm evaluative}=4.53$, SD=0.91, t=0.24, df=133, p=0.814, d=-0.044). No significant differences were detected in the evaluation of the profundity of word-of-mouth between the two groups ($M_{\rm educational}=3.12$, SD=0.77; $M_{\rm evaluative}=3.35$, SD=0.94, t=1.58, df=133, p=0.117, d=-0.268). Thus, these factors were ruled out as potential confounds that could affect the experimental results.

Mediation Analysis: To further examine the relationship between the type of virtual social media influencer narrative strategy, the effectiveness of word-of-mouth, and consumer product preference, a mediation analysis was conducted to assess the role of word-of-mouth effectiveness using Bootstrapping (PROCESS Model 4; Hayes, 2013). The results indicated that the effectiveness of word-of-mouth mediated the influence of virtual social media influencers on consumer brand preference (95% confidence interval β = 0.34, CI = [0.05, 0.61], supporting H2. See Figure 1 for details.

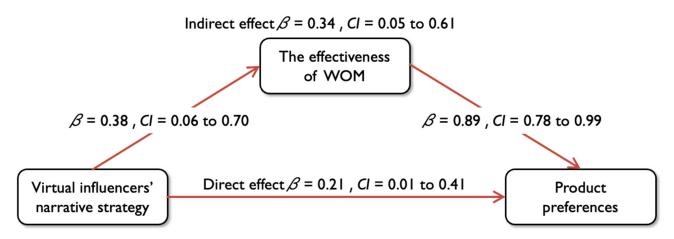


Figure 1. The effectiveness of WOM's mediation model.

The results of Experiment 3 validated H2 and demonstrated a causal chain model from virtual social media influencer narrative strategies to the effectiveness of word-of-mouth, which subsequently led to consumer product preference. The results indicated that virtual social media influencer narrative strategies significantly impacted the effectiveness of the influencer's word-of-mouth, which in turn led to varying consumer product preferences. Experiment 3 confirmed that the effectiveness of word-of-mouth served as a mediator in the relationship between the virtual influencer's narrative strategy and consumer product preference, thereby establishing a complete internal mechanism model. To further analyze the boundary conditions of the main effect, Experiment 4 was designed to investigate the moderating role of perceived product ease of use on the relationship between virtual influencer narrative strategies and consumer product preference.

3.4. Experiment 4

Experiment 4 was conducted to explore the moderating role of perceived product ease of use on the relationship between virtual influencer narrative strategies and consumer product preference, thereby testing H3.

3.4.1. Participants

Based on the calculation method used by Cohen (1977), along with the effect size (f=0.25) and expected power value (Power = 0.80) employed in related studies, the planned sample size was determined using G*Power 3.1 software to be over 179 participants. Therefore, in Experiment 4, 200 participants were recruited from a university to complete a series of survey activities about the new headphones from the Bubo brand. Participants were randomly assigned to a 2 (educational narrative strategy/evaluative narrative strategy) \times 2 (low perceived ease of use/high perceived ease of use) experimental design, yielding a total sample size of (N=183, ages 18–29, M=22.03, SD=1.97, with a female proportion of 48.63%). The sample sizes for each group were as follows: ($n_{\rm educational, low}=45$, $n_{\rm evaluative, low}=45$, $n_{\rm evaluative, high}=46$).

3.4.2. Method

A virtual social media influencer named "April" was created to introduce new product information about the Bubo brand to consumers. To ensure the effectiveness of the narrative strategy manipulation, 60 participants (ages 18–30, M = 22.77, SD = 2.65, 45% female) were recruited online and randomly assigned to two groups (education group/evaluation group) for a pre-test.

Participants were first informed that April was introduced as a very popular virtual social media influencer, and then each group received posts related to the new product information. The educational group was provided with the following information:

"Hi friends! I'm your April. Today, I want to introduce Bubo's latest creation—ultra-HD surround sound Bluetooth headphones. These headphones feature a classic white design, embodying the 'Less is More' philosophy, and have a very clean and sleek appearance. Additionally, they offer incredible sound quality. Bubo uses the latest sound wave transmission technology to ensure pure sound quality and stable transmission, delivering layered sound to the human ear. The shape of the headphones has been rigorously designed with ergonomics in mind, ensuring long-term wear without discomfort. In this product, we can see Bubo's high regard for consumer experience and its continuous pursuit of sound quality and comfort."

The evaluative group was given the following information:

"Hi friends! I'm your April. I recently started using Bubo's new ultra-HD surround sound Bluetooth headphones, and I must say, I am very satisfied with this product. First, the appearance design of these headphones really attracts me. The overall classic white look is very simple and sleek, very appealing. Additionally, the sound quality is unbelievably good. Bubo is said to use the latest sound wave transmission technology to ensure pure sound quality and stable transmission. When I use the headphones to listen to music and watch movies, I can feel the sound is very clear and layered. Moreover, the shape is ergonomic, and I have tried wearing them for several hours without any discomfort. Overall, Bubo's new headphones are impressive in their pursuit of sound quality and comfort, giving me a wonderful experience! I am very satisfied."

Participants were then asked to evaluate the educational and evaluative levels of the narrative strategy used by the virtual influencer. Results showed that the education group scored significantly higher in terms of the educational narrative strategy ($M_{\rm educational} = 4.77$, SD = 0.68; $M_{\rm evaluative} = 2.97$, SD = 0.90, t = 15.23, df = 58, p < 0.001, d = 2.257), while the evaluation group scored significantly higher on the evaluative narrative strategy ($M_{\rm evaluative} = 4.46$, SD = 0.82; $M_{\rm educational} = 2.89$, SD = 0.63, t = 14.47, df = 58, p < 0.001, d = 2.147), confirming the effectiveness of the narrative strategy manipulation in Experiment 4.

Subsequently, 62 participants (ages 18–28, M=22.24, SD=2.45, 38.71% female) were recruited online and randomly assigned to two groups (high perceived ease of use group/low perceived ease of use group) for a pre-test. Each group was provided with posts related to the new product information. The high perceived ease of use group was given the following information:

"Bubo brand recently released new Bluetooth headphones, which are very powerful and easy to use. Almost all consumers can quickly master all its functions. Additionally, the brand provides a voice operation guide for each user. When the headphones are connected to a device, a one-minute voice guide will immediately explain all its functions and usage methods."

The low perceived ease of use group was provided with the following information:

"Bubo brand recently released new Bluetooth headphones, which are very powerful but have complex functionality. The brand has published tutorials in both text and video formats on major social platforms to help consumers learn and master the use of the headphones. Additionally, the brand provides a voice operation guide for each user to help resolve any difficulties encountered during use."

Participants were then asked to evaluate the perceived ease of use of the product introduced by the virtual influencer: "I find it easy to fully understand how to use this product" (7-point scale: 1 = strongly disagree, 7 = strongly agree) [67]. Results showed that participants in the low perceived product ease of use group scored significantly lower on perceived product ease of use than those in the high perceived product ease of use group ($M_{-\text{low ease of use}} = 3.37$, SD = 1.13; $M_{-\text{high ease of use}} = 4.59$, SD = 0.87, t = 4.80, df = 60, p < 0.001, d = -1.210), confirming the effectiveness of the perceived product ease of use manipulation in Experiment 4.

In the main experiment, participants were informed that the activity aimed to investigate consumer attitudes toward new products, and they were asked to evaluate carefully. Participants were introduced to "April", described as a highly popular virtual social media influencer. Participants were first provided with information reflecting high perceived product ease of use or low perceived product ease of use, depending on their assigned group. Participants in the educational group received posts employing the educational narrative strategy, while those in the evaluative group were exposed to the evaluative narrative strategy. To control for the influence of word-of-mouth quantity and psychological distance, participants were informed that this was the first recommendation post they had encountered and were asked to evaluate it from an observer's perspective. Participants subsequently reported their perceived effectiveness of the virtual influencer's word-of-mouth, product preference, and other potentially confounding variables, including personal interests and shopping experiences. Finally, the emotional state was assessed using the affective dimension scale, and participants provided reports on psychological distance, product quality evaluation, the perceived quantity of word-of-mouth, the type of narrative strategy used by the virtual influencer, the influence of past shopping experiences on their preferences, and their speculation regarding the survey's purpose.

3.4.3. Result and Discussion

Manipulation Check: Eleven participants relied on past experience, and six correctly guessed the study's true purpose. The data of these participants were excluded. Participants in the education group scored significantly higher on the educational narrative strategy compared to those in the evaluation group ($M_{\rm educational} = 4.77$, SD = 0.68; $M_{\rm evaluative} = 2.97$, SD = 0.90, t = 15.23, df = 181, p < 0.001, d = 2.257). Conversely, participants in the evaluation group scored significantly higher on the evaluative narrative strategy than those in the education group ($M_{\rm evaluative} = 4.46$, SD = 0.82; $M_{\rm educational} = 2.89$, SD = 0.63, t = 14.47, df = 181, p < 0.001, d = 2.147). Participants in the low perceived product ease of use group scored significantly lower on perceived product ease of use than those in the high perceived product ease of use group ($M_{\rm low} = 2.76$, SD = 0.99; $M_{\rm high} = 4.59$, SD = 0.85, t = 13.50, df = 181, p < 0.001, d = -1.983), indicating the effectiveness of the manipulation for most participants.

Effectiveness of Word-of-Mouth: The results indicated that the interaction between the virtual influencer's narrative strategy (educational/evaluative) and perceived product ease of use (low/high) had a significant effect on the effectiveness of word-of-mouth, F = 4.43, p < 0.05. In conditions of low perceived product ease of use, the education group demonstrated significantly higher word-of-mouth effectiveness compared to the evaluation group ($M_{\rm educational} = 3.84$, SD = 0.90; $M_{\rm evaluative} = 3.38$, SD = 1.01, t = 2.32, df = 88, p < 0.05, d = 0.481). However, under conditions of high perceived product ease of use, no significant difference was found between the two groups ($M_{\rm educational} = 3.23$, SD = 0.94; $M_{\rm evaluative} = 3.37$, SD = 1.02, t = 0.67, df = 91, p = 0.506, d = -0.143).

Product Preference: The results indicated that the interaction between the virtual influencer's narrative strategy (educational/evaluative) and perceived product ease of use (low/high) significantly affected product preference, F = 2.10, p < 0.05. In conditions of low perceived product ease of use, the group exposed to the educational narrative strategy exhibited significantly higher product preference than the group exposed to the evaluative narrative strategy ($M_{\rm educational} = 4.27$, SD = 0.96; $M_{\rm evaluative} = 3.73$, SD = 1.18, t = 2.35, df = 88, p < 0.05, d = 0.502). However, under conditions of high perceived product ease of use, no significant difference was observed between the two groups ($M_{\rm educational} = 3.49$, SD = 1.10; $M_{\rm evaluative} = 3.46$, SD = 1.09, t = 0.15, df = 91, p = 0.885, d = 0.027).

Control Variables: Significant differences in the emotional state among the four groups of participants were not observed (F(3, 179) = 0.06, p = 0.982, $M_{\text{educational, low}} = 3.87$, SD = 0.99; $M_{\text{educational, high}} = 3.89$, SD = 1.09; $M_{\text{evaluative, low}} = 3.84$, SD = 1.17; $M_{\text{evaluative, high}} = 3.80$, SD = 1.02). Psychological distance did not significantly differ among the four groups (F(3, 179) = 0.28, p = 0.839, $M_{\text{educational, low}} = 4.13$, SD = 0.97; $M_{\text{educational, high}} = 4.11$, SD = 1.01; $M_{\text{evaluative, low}} = 3.96$, SD = 0.95; $M_{\text{evaluative, high}} = 4.06$,

SD=1.04). No significant differences were found in product quality perception (F(3,179)=0.69, p=0.559, $M_{\rm educational, low}=4.22$, SD=0.85; $M_{\rm educational, high}=4.47$, SD=0.86; $M_{\rm evaluative, low}=4.40$, SD=0.89; $M_{\rm evaluative, high}=4.43$, SD=0.96). Similarly, no significant differences were identified in the evaluation of the number of word-of-mouth recommendations among the four groups (F(3,179)=1.07, p=0.365, $M_{\rm educational, low}=2.82$, SD=0.78; $M_{\rm educational, high}=2.87$, SD=0.88; $M_{\rm evaluative, low}=3.00$, SD=0.83; $M_{\rm evaluative, high}=3.09$, SD=0.66). Thus, the potential confounding effects of these factors were ruled out.

Moderated Mediation Analysis: The moderated mediation effect of perceived product ease of use was analyzed using Bootstrapping (PROCESS Model 8; Hayes, 2013), and it was found that the interaction between the virtual influencer's narrative strategy (educational/evaluative) and perceived product ease of use (low/high) significantly affected the effectiveness of word-of-mouth (95% confidence interval β = 0.60; CI [0.04, 1.17]). Furthermore, the effectiveness of word-of-mouth was found to significantly influence individual product preference (95% confidence interval β = 0.99; CI [0.91, 1.07]). Under conditions of low perceived product ease of use, the type of virtual influencer narrative strategy significantly influenced product preference through the effectiveness of word-of-mouth (Conditional Indirect Effect, 95% confidence interval $\beta = 0.46$; CI [0.06, 0.84]). However, when perceived product ease of use was high, the indirect effect of the virtual influencer narrative strategy on product preference was not significant (Conditional Indirect Effect, 95% confidence interval $\beta = -0.13$; CI [-0.52, 0.28]). In conclusion, perceived product ease of use effectively moderated the relationship between virtual influencer narrative strategy type and consumer product preference through the effectiveness of word-of-mouth (95% confidence interval $\beta = 0.60$; CI [0.03, 1.14]). See Figure 2 for details.

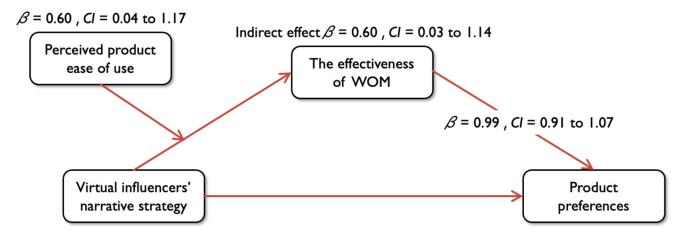


Figure 2. Moderated mediation model.

4. General Discussion

4.1. Conclusions

This study, through the design of four experiments, explored the impact of virtual social media influencers' narrative strategies (educational, evaluative) on consumer product preferences and analyzed the mediating role of word-of-mouth effectiveness and the moderating role of perceived product ease of use. The following are the conclusions of this study.

First, the results of Experiment 1 confirmed the hypothesis that virtual social media influencers using an educational narrative strategy are more effective in enhancing consumer product preferences than those using an evaluative narrative strategy. The educational narrative strategy conveys in-depth product knowledge and logical support, helping consumers understand product characteristics and brand value from a cognitive perspective [41], while the evaluative narrative strategy conveys the influencer's subjective feelings and emotional experiences regarding the product [42]. When interacting with virtual influencers, consumers are more in need of accurate knowledge about the brand

and product to meet the cognitive needs in their purchasing decisions. Therefore, the use of an educational narrative strategy by virtual social media influencers is more likely to meet consumers' media usage needs, thereby positively influencing their product preferences.

Subsequently, Experiment 2 compared the effects of different narrative strategies used by real and virtual social media influencers, finding that only the use of an educational narrative strategy by virtual influencers significantly increased consumer product preferences. In contrast, for real human influencers, there was no significant difference in the effectiveness of the two narrative strategies.

Next, Experiment 3 revealed the mediating role of word-of-mouth effectiveness in the relationship between virtual social media influencers' narrative strategies and consumer product preferences. Word-of-mouth effectiveness is a key precursor to consumer product preferences and subsequent purchasing decisions [50]. The educational narrative strategy, through authoritative and accurate knowledge, effectively enhances the word-of-mouth effectiveness of virtual social media influencers. The evaluative narrative strategy focuses on personalized expression and emotional interaction [42], but virtual influencers, being digital avatars created by CGI and machine learning algorithms, lack genuine sensibility and subjective experience [20]. Consumers' skepticism regarding the authenticity of virtual influencers' subjective feelings diminishes the effectiveness of word-of-mouth recommendations. Therefore, the effectiveness of word-of-mouth mediates the impact of virtual social media influencers' narrative strategies on consumer product preferences.

Finally, Experiment 4 demonstrated that perceived product ease of use significantly moderates the relationship between virtual influencers' narrative strategies and consumer product preferences. When the perceived ease of use of a product is low, consumers' cognitive need to cope with difficulties through media is stronger, making the positive impact of educational narrative strategies on consumer product preferences more pronounced. However, when the perceived ease of use of a product is high, consumers' reliance on virtual influencers to meet cognitive needs is greatly reduced, and the impact of narrative strategy type (educational, evaluative) on product preference is no longer significant.

4.2. Theoretical Implications

Firstly, we expanded the research in the field of virtual social media influencers, providing new insights into their role in consumer decision-making. Existing research on virtual influencers primarily concentrates on how to enhance their market acceptance. Scholars have found that factors such as credibility, attractiveness, expertise, and similarity can enhance the influence of virtual social media influencers [10,18]. Lim and Lee (2023) discovered that increasing emotional interaction in daily communications helps strengthen the parasocial relationship between consumers and virtual influencers [20]. The study by Lou et al. (2023) indicated that carefully curated flaws and self-defense mechanisms can reduce the uncanny valley effect caused by overly realistic virtual social media influencers [21]. To the best of our knowledge, no studies have specifically investigated the marketing effectiveness of different narrative strategies used by virtual influencers, particularly focusing on educational and evaluative strategies. Our study makes a significant theoretical contribution by being the first to conduct a horizontal comparison of these two narrative strategies in the context of virtual influencers. We discovered that the impact of different narrative strategies employed by virtual influencers is distinct from—and even opposite to—that of human influencers. While educational narrative strategies enhance product preference by fulfilling consumers' cognitive needs for information, evaluative narrative strategies do not have the same positive effect in this context, as they focus more on subjective feelings rather than cognitive content. This finding challenges existing assumptions based on human influencers and provides a new lens through which to examine virtual influencer marketing.

Furthermore, our research introduces the Uses and Gratifications Theory to the study of virtual social media influencers, offering a novel framework to explain how consumers interact with virtual influencer content to meet their specific needs. This approach not only fills a gap in previous research but also expands the theoretical landscape by integrating established communication theories into the digital marketing context.

By examining the effectiveness of e-WOM communication and the moderating role of perceived product ease of use, our findings provide fresh theoretical insights into how consumers' needs for narrative content vary with product characteristics. This highlights the importance of narrative strategy selection in aligning with consumer expectations, thereby offering concrete implications for both future research and practical applications.

Through these contributions, our study adds valuable theoretical depth to the academic discourse on virtual influencers and their role in consumer decision-making.

5. Limitation and Future Direction

This study provides deep insights into the impact of virtual social media influencers' narrative strategies on consumer product preferences, but several areas warrant further exploration in future research.

One limitation of our study is the use of college students as the sample, which may affect the generalizability of our findings. While this demographic is relevant and accessible for examining consumer behavior, it does not fully represent the broader population. Future studies should aim to replicate and extend our findings using more diverse and representative samples to enhance the generalizability of the results.

To build on our findings, future studies could explore the nuances of how these narrative strategies apply across a wider variety of products and cultural contexts, extending beyond mere consistency checks. For instance, researchers might investigate the role of educational and evaluative narratives in technology adoption across different societies or how these strategies affect luxury versus necessity goods differently, thus providing a broader understanding of narrative effectiveness based on product type and cultural background.

Additionally, while this study primarily focused on the moderating role of perceived product ease of use, future research could delve into unexplored moderating variables such as psychological factors like consumers' cognitive load or emotional states that might alter narrative effectiveness. Examination of these internal states could offer deeper insights into how consumers process information from virtual influencers.

Furthermore, although the impact of narrative strategies on product preference was verified through experimental methods, the interaction between virtual influencers and consumers in the real world is more complex and diverse. Utilizing longitudinal study designs or ethnographic research could help capture the dynamics of these interactions over time. Moreover, investigating virtual influencer impact in specific real-world settings, such as live shopping events, could provide actionable insights for marketers.

This study also suggests that future research could explore other narrative strategies used by virtual social media influencers and how these strategies interact with educational and evaluative narrative strategies to jointly influence consumers' product preferences. Research could also examine how multimedia elements (e.g., video, audio) within narrative strategies might enhance or diminish their effectiveness, offering a richer multimedia communication framework.

Finally, with the continuous advancement of social media and artificial intelligence technologies, future research could investigate emerging virtual influencer types, such as AI-driven personas with adaptive storytelling capabilities, and evaluate their specific impacts on consumer decision processes. This line of inquiry could be pivotal in understanding future consumer-brand interactions and how businesses can harness these advanced influencers for market communication innovations.

6. Marketing Implications

This study provides guidance and recommendations for companies aiming to promote products through virtual influencers. Since their emergence, virtual influencers have been highly favored by consumers. Companies collaborate with these influencers to promote products and brand activities, seeking to connect with users through social media influencers (SMIs) [34]. The study focuses on the impact of virtual influencers' narrative strategies (education, evaluation) on product preferences, offering practical insights for companies on how to more effectively develop these strategies.

Companies can select virtual influencers for product and brand promotion based on product characteristics and target audience. According to the Uses and Gratifications Theory (UGT), consumers are active agents who deliberately select media and content to meet specific needs. Therefore, companies need to accurately identify their target audience in advance, design the content accordingly, and employ educational narrative strategies to convey product information, thereby achieving a more positive persuasive effect. Simultaneously, companies should pay close attention to the effectiveness of word-of-mouth (WOM) by virtual social media influencers, as the credibility of the information source is crucial to WOM's effectiveness. When developing promotional strategies for virtual social media influencers, companies must emphasize the authenticity and credibility of narrative strategies to enhance consumers' product preferences by improving WOM effectiveness.

Additionally, perceived product ease of use moderates the impact of virtual influencers' narrative strategies on consumer product preferences. Therefore, companies need to assess product usability based on actual conditions. Companies should focus on products with low perceived ease of use; in marketing these products through virtual influencers, the product knowledge and usage instructions conveyed by educational narrative strategies are critical. Finally, companies should regularly evaluate the effectiveness of the narrative strategies used by virtual influencers, continuously optimizing and adjusting strategies to adapt to market and audience changes, thereby improving the effectiveness and profitability of product promotion.

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