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# The Impact of Virtual Influencer's Characteristics on Brand Attitude : The Mediating Effect of Parasocial Interaction\*

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## Abstract

**Purpose:** This study explores the distinctive characteristics of virtual influencers compared to human influencers and examines how parasocial relationships with human consumers affect brand attitude. The hypothesis suggests that virtual influencers can overcome social distance barriers, emphasizing their role in fostering engagement. **Research design, data and methodology:** A structural model based on the source credibility model and unique traits of virtual influencers analyzes these dynamics. An online survey conducted in April 2024 garnered responses from 286 participants. **Results:** Findings reveal that virtual influencers positively impact parasocial interactions, which in turn enhance parasocial relationships and brand attitudes. However, the proposed effect of novelty on brand attitude through parasocial interaction was not statistically supported. **Conclusions:** This study highlights the unique attributes of virtual influencers, such as anthropomorphism, empathy, and novelty, which enhance consumer engagement through parasocial interactions and influence brand attitude. It provides a comprehensive framework for leveraging virtual influencers in marketing, offering significant advantages in maintaining consistent brand messaging and reducing risks associated with human influencers.

**Keywords :** Virtual Influencer's Characteristics, Brand Attitude, Parasocial Interaction

**JEL Classification Code** (up to 3-5): E44, F31, F37, G15

## 1. Introduction

Companies continuously leverage social media for brand promotion and marketing efforts for multiple purposes. In this context, social influencers provide information based on their image instead of traditional commercial advertising models. This approach is received favorably by consumers who accept influencers without much resistance. Social influencers often possess loyal followers ranging from

thousands to tens of millions, thus exerting significant influence over consumer purchasing decisions despite not being professional advertising models.

Although influencer marketing is powerful, it has some drawbacks and obstacles that must be considered when activating it. One significant challenge is the potential for mismatched partnerships between influencers and brands, leading to inauthentic endorsements and reduced consumer trust (Miltgen et al., 2019). Additionally, the high cost of engaging top-tier influencers can strain marketing budgets,

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making it an impractical option for smaller companies (Breves et al., 2019). There is also the risk of negative publicity if an influencer is involved in a scandal or behaves in a manner inconsistent with the brand's values (Jin et al., 2019). Furthermore, the effectiveness of influencer marketing can be compromised by influencer fatigue, where consumers become weary of overly promotional content (Glucksman, 2017). Lastly, measuring influencer marketing campaigns' return on investment (ROI) remains a complex task, as it is difficult to attribute sales directly to influencer activities (Kay et al., 2020).

Virtual influencers, a new type of endorser based on advancements in information and communication technology, have recently been introduced and are expected to replace traditional social media influencers. These virtual influencers are gaining considerable attention from both advertisers and general consumers. With unique personalities and charm, they boast many followers and enjoy high popularity, similar to human influencers. Nevertheless, they fundamentally differ from traditional influencers because they are not real people (Thomas & Flower, 2021). Despite their fictional nature, virtual influencers can be meticulously created to resemble ideal characters with desired traits, such as humanlike name, gender, age, background, and worldview, through a comprehensive marketing approach. Therefore, they can eliminate negative influences caused by human influencers' careless remarks, attitudes, or behaviors, which safeguards the product's reputation and the company's brand image. The related global market is growing, resulting in active presence of notable virtual influencers like 'Lil Miquela' and 'Shudu' in the United States and 'Rozy' in South Korea.

These entities' impressive performance and market growth have fueled the research on effective strategies for virtual influencers. However, existing studies have often attempted to understand virtual influencers merely through the lens of traditional advertising research frameworks or have failed to consider the rapidly evolving technological landscape fully. Therefore, it is necessary to explore the distinct characteristics of virtual influencers from a new perspective and to understand the unique traits and effectiveness of these virtual characters. This study aims to identify additional characteristics that distinguish virtual influencers from human influencers and to examine the mediating effect of the parasocial relationship between human consumers and virtual influencers on brand attitude. Specifically, the study hypothesizes that the characteristics of virtual influencers will play a crucial role in overcoming the social distance barrier, much like human influencers. The concepts of parasocial interaction and parasocial relationship are closely related but distinct. Parasocial interaction refers to the one-sided, immediate engagement that individuals experience with a media figure during a

single encounter, such as watching a video or following social media posts. On the other hand, parasocial relationship develops over time as these repeated interactions accumulate, leading to a more sustained, emotional bond between the individual and the media figure. By focusing on the formation of parasocial interaction and relationships as moderators, this study seeks to investigate these relationships and their implications empirically.

## **2. Theoretical Background**

### **2.1. Influencer Concept and Characteristics**

Virtual influencers are fictional characters that do not exist in the real world but operate in virtual spaces such as social media platforms, amassing numerous followers and influencing their attitudes and purchasing behaviors (Anderson & Sobek, 2020). There are several distinct differences between human influencers and virtual influencers (Meng et al., 2024). Firstly, while human influencers often start with personal interests or hobbies, virtual influencers are meticulously designed to serve commercial purposes. Secondly, unlike their human counterparts, virtual influencers can be more easily controlled to avoid risks associated with inappropriate behavior, thereby maintaining consistent marketing messages and brand image. Thirdly, virtual influencers are not bound by time and space constraints, enabling continuous engagement. Despite these advantages, their non-human nature can cause cognitive discomfort among consumers, resulting in the 'uncanny valley' effect (Mori et al., 2012).

Virtual influencers are endorsers and information sources who convey and reinforce specific messages that companies want to convey. They have similarities with traditional advertising endorsers in their goals. When engaging in interactive communication, the message's source, depending on its characteristics, influences the message's persuasiveness and subsequently affects the attitudes and behaviors of the recipients (Belknap, 1954). The source credibility model is a commonly used theory to explain this phenomenon. According to Ohanian (1991), this model identifies three main features of the information source: attractiveness, trustworthiness, and expertise. Erdogan (1999) proposed adding authenticity to the model, but most researchers agree that attractiveness, trustworthiness, and expertise are the core variables. Existing studies on virtual influencers also predominantly explain the influencer's characteristics based on the source credibility model.

## 2.2. Virtual Influencer Characteristics

The previous studies on virtual influencers have been based on similar frameworks developed for human influencer study (Sokolova & Kefi, 2020), and the lack of related precedent studies is the primary reason for relying on existing research models. However, it is limited to understanding these virtual entities, which possess different characteristics from humans, solely from the same perspective as human influencers. Despite the similarity between human and virtual influencers in transmitting information to recipients, virtual influencers have unique characteristics as message senders (Lee, 2022). Due to their virtual nature, they can operate without temporal or spatial constraints and are meticulously designed to align with corporate marketing intentions, distinguishing them from traditional human sources. Considering these differences, some studies have begun exploring the unique characteristics of virtual influencers (Cotter, 2019).

These aspects have been examined in certain studies, for instance. As previously mentioned, research into the characteristics of virtual influencers frequently relies on the source credibility model and explores different attributes that enhance the explanatory power of this model regarding virtual influencers. Lou and Yuan (2019) looked into the impact of source credibility, attractiveness, and parasocial interaction on the effectiveness of virtual influencers in marketing. Similarly, Sokolova and Kefi (2020) examined the impact of perceived authenticity and trustworthiness on consumer attitudes towards virtual influencers. Furthermore, De Veirman, Hudders, and Nelson (2019) investigated how the uniqueness and innovativeness of virtual influencers affect consumer engagement and brand perception.

According to previous research, virtual influencers are unique in various aspects compared to humans. Anthropomorphism is one of the key variables that distinguish virtual influencers from humans. Anthropomorphism refers to attributing human characteristics or behaviors to non-human entities (Epley et al., 2007; Morewedge et al., 2007). They are accepted as individual personalities by imbuing non-human entities with humanlike attributes (Epley et al., 2007). This attribute is a critical evaluation criterion for consumers regarding virtual influencers. Generally, humans tend to feel discomfort and psychological unease towards impersonal entities. To ease this tension, companies design human-friendly virtual influencers and encourage a positive attitude towards the endorsed products or brands.

Similarly, the emphasis is placed on providing empathy. Empathy is the ability to express individual attention and affection towards consumers (Gorry & Westbrook, 2011). Influencers who have empathy have greater accessibility to consumers, facilitate smooth communication, and show

more attention and care to individuals. Empathy allows for personalized management, enabling consumers to enjoy more value and benefits. Despite the limitation of not being real humans, virtual influencers can utilize advanced emotional big data and text mining to identify consumer needs and engage in real-time, interactive empathy through various multimodal means such as visuals, sound, and text. Virtual influencers can maintain one-on-one empathetic interactions even with increasing followers, while human influencers face increasing difficulty in personal communication due to the one-to-many communication limitation.

The other essential characteristic is novelty, which is defined as rarity and newness. Virtual entities can be viewed as intriguing despite their anthropomorphism. Creativity, a crucial element in determining advertising effectiveness, stems from novelty and can reinforce the recipient's engagement with the message (Kover et al., 1995). Thus, virtual influencers are expected to provide both familiarity and originality simultaneously. Enhancing the message's attention through the novelty of virtual influencers can lead to greater preference and trust in the featured products, brands, and other company offerings.

## 2.3. Parasocial Interaction and Brand Attitude

Parasocial relationships refer to the phenomenon where the actions of actors appearing on non-interactive media create an illusion of direct interaction with passive viewers, leading to the formation of a seemingly intimate relationship (Horton & Wohl, 1956). The message sender engages in one-way, intentional, and manipulative behavior during parasocial interaction. However, the message receiver feels they are engaging in a mutual understanding and interaction, thus forming a parasocial relationship (Dibble et al., 2016).

Like traditional media, online social media platforms have been observed to have active parasocial interactions and relationships. The platform characteristics of social media environments facilitate user interaction inherently (Labrecque, 2014). The intimate relationships that social media users form with celebrities are a source of enthusiasm for them (Sokolova & Kefi, 2020). Although the two-way interactions with human influencers on social media are limited, and managing one-on-one interactions with large follower groups is increasingly challenging, the successful formation of parasocial relationships remains notable (Labrecque, 2014). Therefore, if general consumers accept virtual influencers similarly to their human counterparts, it can be inferred that parasocial interactions and relationships are also occurring between virtual influencers and their followers.

The quantitative and qualitative reinforcement of interactions and the formation of parasocial relationships

can be more effective in persuading followers. Influencers usually attract followers with similar values, beliefs, interests, and consumption behaviors, and by strengthening interactions and relationships, these followers' loyalty can be strengthened. Previous studies have suggested that perceived parasocial relationships with social media influencers positively affect brand attitudes, purchase intentions, and word-of-mouth intentions. The more significant the parasocial relationship media users perceive with the actor in the communication process, the greater their likelihood of aligning cognitively, emotionally, and behaviorally with the actor. This result also indicates a strong need for parasocial interactions and relationships with virtual influencers.

### 3. Research Model and Hypotheses

#### 3.1. Research Framework

This study constructs a structural model based on prior research, incorporating key characteristic variables from the source credibility model and additional unique traits of virtual influencers. The model explores how these factors affect parasocial interactions to establish parasocial relationships and their subsequent impact on brand attitude. Among the variables from the source credibility model, the expertise variable has been excluded. This decision is based on the shift in virtual influencers' content from information provision to predominantly entertainment, reducing the necessity for expertise. Additionally, previous studies, such as those by Lim et al. (2017), have questioned the relevance of expertise as a necessary characteristic of influencers. Instead, the study includes the similarity variable proposed by Deshpande and Stayman (1994), given that virtual influencers mimic human forms and aim to align with the recipient's primary interests, values, preferences, and behaviors.

Furthermore, to understand the influence of virtual influencers' characteristics on parasocial interaction, relationships, and brand attitude, the study incorporates anthropomorphism, empathy, and novelty variables examined in previous research. These variables are integrated into the research framework to evaluate their combined effect on fostering parasocial interactions and relationships, ultimately impacting brand attitude. The aim is to provide a comprehensive understanding of how virtual influencers can effectively engage with consumers and influence their perceptions and behaviors toward brands.

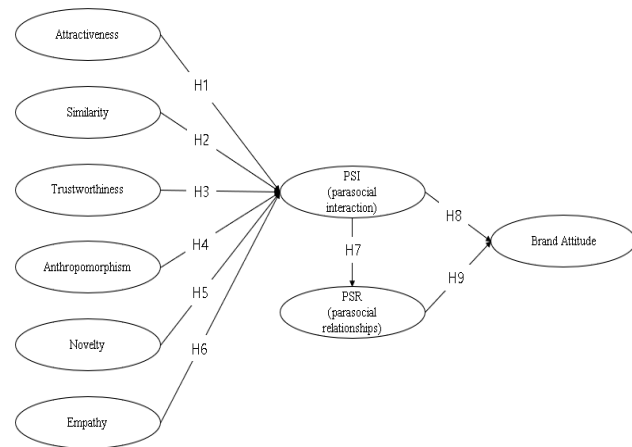


Figure 1: Research Model

#### 3.2. Hypotheses on Influencer Characteristics

Attractiveness is the degree to which an individual perceives another as likable in interpersonal relationships (McCroskey et al., 1974). Attractiveness significantly influences social interactions, as individuals are more affected by the cognition and behavior of attractive counterparts (Ellegarrd & Koch, 2012). This effect extends to parasocial interactions, where higher attractiveness enhances social interactions (Rubin & McHugh, 1987). Based on this, the following hypothesis is proposed:

**H1:** Attractiveness positively influences parasocial interaction.

Perceived similarity with the source of information positively impacts communication efficiency (Belch & Belch, 2015). Perceived similarity fosters intimacy with the information source and reduces apprehension, thereby positively affecting the acceptance of messages provided by the source (Kim, 2022). Hence, the following hypothesis is proposed:

**H2:** Similarity positively influences parasocial interaction.

Recipients tend to reject messages from untrustworthy information sources, while they engage more positively with honest and sincere sources (Sokolova & Kefi, 2020). Rubin, Perse, and Powell (1985) found that viewers who perceive television personalities as trustworthy are more likely to develop parasocial relationships with them. Their research indicated that trustworthiness significantly contributes to the emotional bond viewers feel towards media figures, facilitating a stronger parasocial interaction. Similarly, Sokolova and Kefi (2020) investigated the role of social

media influencers' trustworthiness and found a positive correlation between trustworthiness and the level of parasocial interaction followers experience. Therefore, the following hypothesis is proposed:

**H3:** Trustworthiness positively influences parasocial interaction.

Research in animation has shown that, despite being fictional, anthropomorphized characters are more easily perceived as participants in parasocial interactions (Hoffner, 1996). Waytz, Cacioppo, and Epley (2010) found that anthropomorphized objects or beings elicit stronger emotional responses and interpersonal connections from individuals, thus facilitating parasocial interactions. Their research suggests that when consumers perceive non-human entities as having human-like qualities, they are more likely to form parasocial relationships with them. Therefore, the following hypothesis is proposed:

**H4:** Anthropomorphism positively influences parasocial interaction.

Novelty, or the quality of being new and unusual, has been shown to capture attention and increase engagement, thereby fostering parasocial interactions. Studies have demonstrated that novel stimuli evoke curiosity and interest, critical drivers of deeper engagement and emotional connection. For example, Tokunaga (2013) found that novel experiences and elements in media content significantly increase viewer engagement and emotional responses, which is essential for developing parasocial interactions. Additionally, Lee and Watkins (2016) examined the impact of novel marketing strategies, such as virtual influencers, on consumer engagement. Their findings indicated that the novelty of virtual influencers attracts consumer attention and enhances their emotional connection to the influencer, promoting parasocial interaction. Therefore, the following hypothesis is proposed:

**H5:** Novelty positively influences parasocial interaction.

Interactions with influencers perceived as similar to oneself, rather than professional influencers, are more frequent and persuasive (Xiang et al., 2014). Especially on social media, where users engage and empathize with each other, followers are more likely to immerse in interactions and relationships with influencers who share similar interests or tastes (Xiang et al., 2016). Therefore, the following hypothesis is proposed:

**H6:** Empathy positively influences parasocial interaction.

### 3.3. Parasocial Interaction and Brand Attitude

When parasocial interaction is sustained and repeated over a long period, individuals may perceive a parasocial relationship, feeling like they have a real social connection. According to the Construal Level Theory, psychological distance can be perceived regarding specific objects or events, and attitudes and behaviors change based on this perceived distance. This psychological distance can be reduced if parasocial interaction is perceived as active, leading to positive relationships. Conversely, if such interactions are abruptly discontinued after prolonged exposure to online media, users may experience emotional distress and loneliness from the perceived relationship break (Lee & Watkins, 2016). Thus, the following hypothesis is proposed:

**H7:** Parasocial interaction positively influences parasocial relationships.

Parasocial interaction is generally known to affect brand attitude positively. Kim (2022) empirically demonstrated that an influencer's social presence positively impacts brand attitude through the mediation of parasocial interaction. Similarly, Sokolova and Kefi (2020) found that parasocial interaction mediates the relationship between perceived trustworthiness and brand attitude. Therefore, the following hypothesis is proposed:

**H8:** Parasocial interaction positively influences brand attitude.

Parasocial relationships, which are one-sided relationships where one party knows a great deal about the other, often occur between media personalities or influencers and their audience. Research has shown that these relationships can significantly affect consumers' perceptions and attitudes towards the brands endorsed by the influencers. For instance, Labrecque (2014) found that parasocial interactions with social media influencers can enhance consumers' attitudes toward the brands they promote. The study indicated that the emotional bond formed through parasocial relationships increases trust and likability, thereby positively influencing brand attitudes. Similarly, Chung and Cho (2017) examined the effects of parasocial relationships on consumer behavior and concluded that strong parasocial bonds lead to more favorable brand attitudes and increased brand loyalty. Their findings suggest that when consumers feel a personal connection with an influencer, their positive feelings are transferred to the associated brands. Thus, the following hypothesis is proposed:

**H9:** Parasocial relationships positively influence brand attitude.

## 4. Empirical Research

### 4.1. Data Collection

To examine the research hypotheses empirically, individuals who watched advertisements or YouTube content featuring Rozy, a well-known virtual female influencer in South Korea, were recruited as participants. Over a week in April 2024, 400 potential participants were invited to an online survey platform, with 286 ultimately responding to the survey. The demographic characteristics of the participants are as follows: 156 males (54.5%) and 130 females (45.5%). The largest age group was those in their 30s, with 131 participants (45.8%), followed by those in their 20s with 67 participants (23.7%), 40s with 44 participants (15.4%), 50s with 34 participants (11.9%), and over 60 with 9 participants (3.1%). Thus, participants in

their 20s and 30s comprised most of the sample. Regarding educational background, 191 participants (66.8%) had graduated from university, 32 participants (11.2%) had completed graduate school, 28 participants (9.8%) had a high school education or less, 19 participants (6.6%) were currently in university, and 16 participants (5.6%) were currently in graduate school. This result indicates that the majority of participants were university graduates. The primary social media platforms used by the participants were Instagram and YouTube, with 138 (48.3%) and 133 (46.5%), respectively.

### 4.2. Reliability and Validity

All measurement items used in this study were referenced from prior research to ensure face validity. These scales were then translated and revised to suit the research context. This process involved careful adaptation to maintain the relevance and accuracy of the scales within the specific study environment.

**Table 1:** Items and Reliability Scores

Constructs (Source)	Measurement Items	Cronbach alpha	Composite reliability	AVE
Attractiveness (Wiedmann & Mettenheim, 2020)	The virtual influencer has an outstanding appearance. The virtual influencer's perceived characteristics are superior.	0.843	0.927	0.864
Trustworthiness (Wiedmann & Mettenheim, 2020)	The virtual influencer is trustworthy. The virtual influencer is honest. The virtual influencer is sincere. The virtual influencer is reliable.	0.928	0.949	0.822
Similarity (Fu et al, 2018)	I think the virtual influencer and I have a lot in common. I believe the virtual influencer has similar values to mine. I think the virtual influencer has similar interests to mine. I believe the virtual influencer has similar tastes to mine.	0.944	0.960	0.857
Anthropomorphism (Nowak & Rauh, 2008)	The virtual influencer feels like a real person. The virtual influencer looks like a human.	0.778	0.900	0.818
Novelty (Altsech, 1996)	The virtual influencer is unique. The virtual influencer is different from the usual expectations of influencers. The virtual influencer is interesting. The virtual influencer is distinctive compared to other influencers.	0.872	0.912	0.722
Empathy (Pelau et al, 2021)	I feel comfortable when interacting with the virtual influencer. The virtual influencer understands my feelings and responds appropriately. The virtual influencer recognizes my interests and shows appropriate attention.	0.919	0.948	0.860
Parasocial Interaction (Chung & Cho, 2017)	If the virtual influencer appears on another media platform, I will watch that program. I enjoy predicting what the virtual influencer will do next. I sometimes search for more information about the virtual influencer to learn more.	0.881	0.926	0.807
Parasocial relationship (Parks & Floyd, 1996)	The virtual influencer makes me feel like I am with someone I know well. I consider my relationship with the virtual influencer important. I will do my best to maintain my relationship with the virtual influencer.	0.927	0.953	0.872
Brand attitude	I am satisfied with the brand promoted by the virtual influencer.	0.816	0.916	0.844

(Marti-Parreno et al, 2013)	The brand promoted by the virtual influencer has many advantages.			
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A confirmatory factor analysis (CFA) was conducted to verify the validity of the variables. The results of the CFA indicated a satisfactory fit in general, with a chi-square value of 508.327 (df=288, p=0.000). Although the fit indices GFI (0.884) and AGFI (0.847) were slightly below the 0.9

threshold, they were still within an acceptable range. Other fit indices demonstrated satisfactory values: NFI = 0.931, TLI = 0.961, CFI = 0.968, SRMR = 0.033, and RMSEA = 0.052. Overall, these results suggest that the model exhibits a good fit.

**Table 2:** CFA Analysis

Items	Estimate	S.D	T-value	P-value
attractiveness1	0.871	0.028	31.442	0.000**
attractiveness2	0.836	0.037	22.605	0.000**
Similarity1	0.804	0.028	28.582	0.000**
Similarity2	0.883	0.018	47.928	0.000**
Similarity3	0.917	0.017	54.667	0.000**
Similarity4	0.887	0.02	43.996	0.000**
trustworthiness1	0.887	0.023	38.907	0.000**
trustworthiness2	0.886	0.023	37.726	0.000**
trustworthiness3	0.913	0.019	47.905	0.000**
trustworthiness4	0.907	0.018	49.352	0.000**
anthropomorphism1	0.902	0.034	26.789	0.000**
anthropomorphism2	0.706	0.044	15.872	0.000**
novelty1	0.717	0.042	17.215	0.000**
novelty	0.816	0.03	27.128	0.000**
novelty3	0.829	0.031	26.954	0.000**
novelty4	0.806	0.028	28.7	0.000**
empathy1	0.917	0.013	70.073	0.000**
empathy2	0.851	0.026	32.826	0.000**
empathy3	0.898	0.023	39.686	0.000**
Parasocial interaction1	0.862	0.019	44.343	0.000**
Parasocial interaction2	0.842	0.022	37.893	0.000**
Parasocial interaction3	0.826	0.025	32.309	0.000**
Parasocial relationship1	0.880	0.021	42.368	0.000**
Parasocial relationship2	0.898	0.018	49.062	0.000**
Parasocial relationship3	0.923	0.013	72.884	0.000**
brand attitude1	0.856	0.026	32.802	0.000**
brand attitude2	0.804	0.029	28.204	0.000**

$\chi^2=508.327(df=288.000, p=.000)$  / GFI=0.884 / AGFI=0.847 / NFI=0.931 / TLI(NNFI)=0.961 / CFI=0.968 / SRMR=0.033 / RMSEA=0.052

To test for discriminant validity, the Fornell-Larcker test was performed. The square root of the AVE (Average Variance Extracted) was presented for the same latent variables, while correlation coefficients were presented for different latent variables. Discriminant validity is considered established if the square root of the AVE for each latent variable is greater than the correlations with other

latent variables. For example, the minimum value of the square root of the novelty derived was 0.850. Since none of the correlation coefficients among the latent variables exceeded this minimum AVE square root value, the discriminant validity of the research model is interpreted as satisfactory.

**Table 3:** Fornell-Larcker Test

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
① Empathy	0.927								
② Novelty	0.625	0.850							
③ Attractiveness	0.522	0.550	0.929						
④ Brand attitude	0.701	0.642	0.571	0.919					
⑤ Trustworthiness	0.661	0.616	0.546	0.634	0.925				
⑥ Similarity	0.657	0.604	0.504	0.612	0.621	0.906			
⑦ Anthropomorphism	0.593	0.568	0.602	0.561	0.527	0.590	0.904		
⑧ Parasocial relationship	0.714	0.635	0.528	0.695	0.673	0.759	0.644	0.934	
⑨ Parasocial interaction	0.724	0.667	0.619	0.631	0.764	0.708	0.642	0.778	0.898

### 4.3. Hypothesis Test

Partial Least Squares (PLS) structural equation modeling was used to analyze the causal relationships presented in the research model. PLS is an effective method for causal analysis when the research topic is relatively new and novel, when there is a lack of prior research, or when collecting a sufficient sample size is challenging (Lee et al., 2018). Given the short research history of virtual influencers and new variables used in this study, PLS was deemed a more appropriate analytical method than other empirical approaches. In the analysis process, hypotheses were tested using SmartPLS 4.1 software, with 1,000 bootstrapping simulations repeated for validation.

The primary hypothesis test results indicated that the characteristics of virtual influencers positively influence parasocial interaction. Additionally, parasocial interactions positively affected both parasocial relationships and brand attitude.

The mediation effect test results revealed satisfactory results in general, except that the hypothesis suggesting that novelty would positively influence brand attitude through the mediation of parasocial interaction was rejected at the significance level of 0.05 ( $p = 0.078$ ). Except for novelty, all mediation pathways between the other variables of virtual influencer characteristics and brand attitude through parasocial relationships were supported.

**Table 4:** Hypothesis Test

Hypothesis	Estimates	S.D	t-value	p-value
H1. Attractiveness → Parasocial interaction	0.121	0.04	3.029	0.002**
H2. Similarity → Parasocial interaction	0.188	0.050	3.735	0.000**
H3. Trustworthiness → Parasocial interaction	0.336	0.057	5.926	0.000**
H4. Anthropomorphism → Parasocial interaction	0.115	0.046	2.521	0.012**
H5. Novelty → Parasocial interaction	0.099	0.046	2.121	0.034**
H6. Empathy → Parasocial interaction	0.187	0.053	3.438	0.001**
H7. Parasocial interaction → Parasocial relationship	0.778	0.025	31.277	0.000**
H8. Parasocial interaction → Brand attitude	0.232	0.068	3.404	0.001**
H9. Parasocial relationship → Brand attitude	0.515	0.061	8.397	0.000**



## 5. Conclusion

### 5.1. Academic Implications

The academic implications of this study are as follows: First, previous research on virtual influencers has primarily relied on the characteristic variables of advertising endorsement models or utilized the source credibility model, focusing on factors such as expertise and similarity to explain the characteristics of virtual influencers. While these variables used in the traditional models have significantly broadened our understanding of virtual influencers, they have proven insufficient in fully explaining and comprehending the intricacies of virtual influencers, which converge with the internet, multimedia, and recent artificial intelligence technologies. This study introduces additional variables—anthropomorphism, empathy, and novelty—as characteristics of virtual influencers to expand our understanding. Thus, this research extends the application of the source credibility model by incorporating virtual influencers' unique attributes.

Second, this study confirms that the characteristic factors of virtual influencers influence consumer behavior through the mediation of parasocial interaction. This finding demonstrates that virtual influencers must fulfill the characteristics required of traditional influencers or advertising endorsers while simultaneously providing humanness, uniqueness, and familiarity as virtual entities. While prior research has concentrated mainly on human influencers, this study's findings suggest that virtual influencers can also form meaningful parasocial relationships with consumers.

Third, this study identifies the critical pathways that constitute parasocial relationships. Unlike previous studies, which primarily analyzed the impact of influencer characteristics on user behavior through parasocial interaction, this study presents and empirically demonstrates the structural relationship between parasocial interaction and parasocial relationships. While interaction and relationships are highly related concepts, they must be understood.

Fourth, by analyzing the structural impact of virtual influencer characteristics on brand attitude, this study emphasizes the importance and necessity of academic research on virtual influencers. Compared to the active research on advertising endorsers and human influencers, virtual influencers remain a relatively new subject of study. In conclusion, this study contributes to the growing literature on virtual influencers by elucidating their unique characteristics and how they influence brand attitude. It offers a comprehensive framework for understanding how virtual influencers can be leveraged in marketing strategies.

### 5.2. Managerial Implications

The practical implications of this study for professionals in marketing, advertising, and public relations are as follows: First, while many companies are rushing to adopt virtual influencers, there remains uncertainty about their effectiveness. Unlike human influencers, for whom key performance data on recognition and preference are available, virtual influencers are still relatively unfamiliar. This study provides empirical evidence that virtual influencers can be effective advocates, confirming their potential as a valuable marketing tool.

Second, virtual influencers are meticulously designed according to the company's intentions, including their appearance and personality. However, achieving these objectives can be challenging without understanding the characteristics of virtual influencers as perceived by users. This study offers insights by suggesting additional unique characteristics of virtual influencers beyond traditional influencers, providing marketing practitioners with guidelines for building compelling virtual influencer personalities. Marketers can leverage the findings to strategically design virtual influencers with specific attributes that enhance their effectiveness.

Third, this study demonstrates that virtual influencers can foster parasocial interactions and relationships, leading to positive outcomes such as enhanced brand attitude. This result implies that companies should consider the relationship-building process between virtual influencers and general consumers, investing in efforts to establish their connections.

Fourth, virtual influencers offer a significant advantage in mitigating risks associated with human influencers, such as inappropriate behavior or inconsistent messaging. Companies can use virtual influencers to maintain a consistent and controlled brand image, ensuring marketing messages align perfectly with corporate values and objectives. Marketing professionals need to recognize the importance of maintaining and managing the continuous image of virtual influencers to foster long-term relationships with users. The study provides actionable insights for marketers looking to incorporate virtual influencers into their strategy.

### 5.3. Limitation and Further Research

Despite this study's academic and practical implications, several limitations exist that future research can address and improve upon. First, most study participants are in their 20s and 30s, while the remaining are in their 40s and older. Although the age distribution of the sample is relatively balanced, this study did not examine age-specific differences in perceptions of virtual influencers. Given that

acceptance of technological innovations can vary by age group, future research should conduct a multi-group analysis to explore these age-specific differences.

Second, this study focused on participants who have experienced Rozy, a relatively well-known Korean female virtual influencer in South Korea, as the experimental stimulus. However, virtual influencers are not limited to females or in humanoid forms. They can also be male or gender-neutral and include anthropomorphized cartoon characters or animals. Future research should consider additional analyses that account for the gender, type, or species of virtual influencers. By overcoming these limitations, future studies can provide new research directions and more comprehensive insights into the field of virtual influencers.

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