

## Article

# Predictors Affecting Effects of Virtual Influencer Advertising among College Students

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**Abstract:** Currently, in many realms, such as entertainment and marketing communications, human influencers have been replaced by virtual ones. As a result, marketing researchers are devoting more attention to the use of virtual influencers. The current study investigates predictors affecting the effects of virtual influencer advertising. Specifically, this study is designed to examine the effects of para-social interaction as relationships between virtual influencer and audiences. In addition, this study delves into the effects of perceived human-likeness, perceived predictability, and perceived authenticity in the evaluation of virtual influencer advertising. For this study, a total of 179 college students majoring in advertising and public relations participated in exchange for course credits. To collect data, an online survey site was created through Qualtrics. This study found that parasocial interactions with a virtual influencer positively affect attitude toward a virtual influencer. Furthermore, perceived human-likeness, perceived predictability, and perceived authenticity also positively influence attitude toward a virtual influencer. Lastly, study findings suggest that attitude toward a virtual influencer has a positive impact on attitude toward adverts. Theoretical as well as practical implications are discussed.

**Keywords:** virtual influencer; para-social interaction; human-likeness; authenticity; predictability



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## 1. Introduction

Marketers care a great deal about how their consumers make a purchase decision. According to the customer decision journey model developed by McKinsey Consulting Company, consumers are likely to follow a series of steps when deciding whether to purchase a brand or service from a particular company [1]. In general, the customer decision model employs a circular model to show how the buying process fuels itself and to highlight pivots or touch points. These pivots or touch points may refer to media where consumers seek information about brands or products they want to purchase. For instance, most consumer decision journeys start online, where consumers look at website reviews and social media recommendations. In addition, touch points could include SNS ads, retargeting online ads, blogs, and Instagram.

More than 3.4 billion people actively use social media (a number that comprises 45% of the world's population) [2]. It should be no surprise then that the most powerful touch-point for consumers has become social media influencers. Social media influencers are individuals who enjoy a reputation for their knowledge and expertise on a specific topic. They wield their influence on consumers by posting about their preferred topics or brands on their social media channels. Marketers understand that social media influencers help create trends and encourage their followers to buy products they promote, which is why they utilize them. Prior research shows that, when it comes to making a purchase decision, some consumers regard social media influencers to be more credible than companies [3,4].

The field of virtual influencers is a relatively new and rapidly growing area, and there are several reasons why studying it can be important. In terms of changing the landscape of social media, virtual influencers are becoming more popular on social media platforms

such as Instagram, TikTok, and YouTube, and are rapidly gaining followers [5]. As more people spend their time on these platforms, it becomes essential to understand the impact virtual influencers have on user behavior and preferences. In addition, new marketing opportunities arise. Virtual influencers can offer unique marketing opportunities for brands, as they can be customized to fit a specific audience or niche [6]. Studying virtual influencers can help companies identify the best ways to leverage this new marketing channel.

Today, virtual influencers pose a threat to the power of human influencers. The current study examines what factors influence the effects of virtual influencer advertising. First, it delves into para-social interaction as regards the relationship between the virtual influencer and audiences. Second, this study investigates characteristics of virtual influencers such as perceived human-likeness, perceived predictability, and perceived authenticity in evaluation of virtual influencer advertising. While research on virtual influencers has been growing, little of it has examined the effects of virtual influencer advertising. Thus, this study aims to provide practical implications for marketers employing virtual influencers for their advertising campaigns.

## 2. Theoretical Framework

### 2.1. *The Rise of Virtual Influencer Marketing*

According to Brown and Hayes [7], the term influencer refers to “a third party who significantly shapes the customer’s purchasing decisions but may never be accountable for it”. In social media, influencers have to date served as trendsetters, impacting customers’ purchasing decisions. In fact, “influencer” has been used interchangeably with “social media influencer”, which has been defined as “an opinion leader or tastemaker in one or more areas of consumption who has a considerable following on social media” [8]. Social media has indeed become a prominent platform on which to promote products and services via social media influencers. Research shows that social media influencers may be perceived as more credible by decision-making consumers than companies [3,4]. Thus, by 2020, influencer marketing as a format of marketing communications had grown to a market value of USD 5 to USD 10 billion [9].

Although consumers are more likely to interact with real-life influencers, virtual influencers are becoming more common. Virtual influencers prevail on social media; however, their impact is being felt in music, entertainment, home-shopping channels, advertising, and so on. Recently, virtual influencers who seem to have become more human than humans have encroached on territory formerly held by human social media influencers. Here, virtual influencers, according to Guthrie [10], may refer to either “computer-generated avatars that are imbued with human characteristics and personalities or a composite of computer-generated imagery (CGI) overlaid on a real human body form”. In short, virtual influencers are fictional computer-generated people who have the realistic characteristics, features, and personalities of humans [11].

In 2018, Lil Miquela, the first virtual influencer on Instagram, was named as one of the 25 most influential people on the Internet [12] even though she was not a real human being. Miquela was created by Brud, a Los Angeles-based tech startup and first appeared on Instagram in 2016. Since then, she has gained over two million Instagram followers and been featured in campaigns by several brands such as Prada, Calvin Klein, Samsung, and Dior [13]. As any other human influencers, Miquela has a human-like profile. She is a progressive 19-year old musician and arts student who supports Black Lives Matter and transgender rights [14]. After the emergence of Lil Miquela, there began to appear many other virtual influencers such as Shudu (a creation of photographer Cameron James-Wilson), Bermuda (the creation of Cain Intelligence—a machine learning and artificial intelligence company), and Imma (the creation of Tokyo-based CG company Modeling Café) [11].

For brands, using virtual influencers offers several advantages. First, virtual influencers pose no unexpected risk for their sponsoring company. Human influencers, in contrast, are often involved in negative scandals, which may temporarily tarnish brands’ hard-won reputations. Second, companies’ can easily adapt their virtual influencers to

their marketing objectives, given that a team of humans or artificial intelligence (AI) tailor the messages to the companies' goals. Thirds, virtual influencers can work 24 h a day, need not travel, need not negotiate on compensation, and need not abide by labor laws. In particular, avatar-like influencers can be placed within any context to achieve persuasive communication [10].

## 2.2. Relationship between Virtual Influencer and Consumers: Parasocial Interaction

In social media engagement, scholars consider parasocial interaction to be an important concept. Parasocial interaction, according to Stein, Liebold, and Anders [15], is defined as an individual's one-sided situational reactions toward characters depicted in mass media. Research suggests that parasocial interaction consists of three dimensions—cognitive, affective, and conative [16,17]. In social media contexts, consumers engage in parasocial interactions with social media influencers, eventually developing parasocial relationships with them.

Horton and Wohl [18] found that individuals develop a sense of intimacy and identification with the celebrity via the media, and this phenomenon is called a parasocial relationship. The parasocial relationship is formed when individuals develop varying degrees of identification with a celebrity or media personality. Prior studies show that media audiences experience parasocial interactions with cartoon characters, virtual avatars, and even bodiless chatbots [19–21]. In response to the significant influence of parasocial interactions on the media reception process, scientists and media producers have attempted to identify factors that could be linked to stronger parasocial responses among audiences [22]. As a result, various distinguishing characteristics on both the side of the media user and the media character have been uncovered as crucial precursors to the intensity and nature of parasocial interactions [23]. Thus, it is plausible to conjecture that people undergo parasocial interactions with virtual influencers.

Consumers are likely to be involved with their media characters via parasocial interactions [24]. Consequently, they may be interested in knowing about their favorite media personalities. It seems that parasocial interactions facilitate relationships between audiences and their favorite personalities. In the virtual influencer context, it is assumed that parasocial interactions with a virtual influencer may lead to positive attitudes toward a virtual influencer. Thus, the following hypothesis is proposed, related to followers' photo attitudes:

**H1.** *Parasocial interactions with a virtual influencer will positively affect (a) attitude toward a virtual influencer and (b) attitude toward ad.*

## 2.3. Perceived Human-Likeness

The rise in virtual influencers has made consumers more aware of the potential for manufactured realities in influencer marketing [25]. According to Ruijten, Haans, Ham, and Midden [26], human-like characteristics are generally categorized into appearances, thoughts, and emotions. Human likeness in appearance refers to characteristics that reflect human form or behavior including both physical shapes and physical abilities [26]. According to a study, consumers responded better to interaction with human-like virtual influencers regarding their appearance and lifelike activities [27]. Human likeness in thoughts is defined as characteristics that reflect cognitive states and processes [26]. Lastly, human likeness in emotions is defined as characteristics that indicate subjective conscious experiences, which can be distinguished in primary and secondary ones [26].

The uncanny valley theory, which is related to the effect of robot appearance, predicts that people's familiarity with a robot increases as the appearance of the robot increases in human likeness [28]. In other words, a human appearance or behavior can make an artificial figure seem more familiar for viewers. Thus, the following hypothesis is proposed as below:

**H2.** *Perceived human-likeness of a virtual influencer will positively affect (a) attitude toward a virtual influencer and (b) attitude toward adverts.*

#### 2.4. Perceived Authenticity

In advertising, the concept of “authenticity” has become important. Psychologists define authenticity as the quality of being true to oneself [29]. In his social interaction framework, Goffman [30] defined authenticity as the portrayal of an unpolished personality, behaviors, and beliefs that are practiced backstage or with trusted companions. In advertising, though, authenticity takes on a different meaning. Authentic advertising refers to advertising “that conveys the illusion of the reality of ordinary life in reference to a consumption situation” [31]. In a similar vein, Miller [32] suggested that advertising authenticity refers to “the extent to which consumers perceive an ad is portraying the brand in a manner that resembles reality”.

In terms of the effects of authenticity in advertising, research findings suggest that an advert’s authenticity has a positive impact on attitudes [32–34]. Schallehn, Burmann, and Riley [34] found that perceived authenticity increases the consumers’ level of trust, resulting in a positive attitude toward the ads. Similarly, Miller [32] found that advertising authenticity positively influenced consumers’ attitude toward advertising and brand. Several studies have demonstrated that authenticity can have a positive impact on a product’s perceived quality and trustworthiness, as well as on consumers’ willingness to purchase it and receptivity to its messaging [35,36]. In addition, according to Pöyry, Pelkonen, Naumanen, and Laaksonen [37], perceived authenticity of social media celebrity is positively related to followers’ photo attitudes. Thus, the following hypothesis is posited as below:

**H3.** *Perceived authenticity will positively affect (a) attitude toward a virtual influencer and (b) attitude toward advertising.*

#### 2.5. Attitude toward Virtual Influencer

In Ajzen’s work [38], it was suggested that people form attitudes towards a broad range of objects. Attitude is defined as “a learned predisposition of human beings” [39]. Kotler [40] also defined attitude as “an individual personal evaluation, emotional feeling attached and action tendency towards some objects or ideas”. Bergkvist, Hjalmarson, and Mägi [41] defined attitude towards a celebrity as someone’s positive or negative evaluation (like or dislike) of the celebrity. In the current study, attitude towards a virtual influencer is defined as someone’s positive or negative evaluation of a virtual influencer.

In the celebrity-endorsement context, prior research has found that attitude toward a celebrity endorser results in a favorable evaluation of advertisements and brands, as well as increased purchase intentions [42–46]. Hence, the following hypothesis is proposed:

**H4.** *Attitude toward a virtual influencer will positively attitude toward advertising.*

### 3. Method

#### 3.1. Sample and Data Collection

A total of 179 college students (who represent MZ generation) participated in the study in exchange for course credits. Among 179 participants, juniors made up the majority (46.9%,  $n = 84$ ); the rest were seniors (30.2%,  $n = 54$ ), freshmen (20.1%,  $n = 36$ ), and sophomores (2.8%,  $n = 5$ ). Of the subjects, 38.5% ( $n = 69$ ) were male and 61.5% ( $n = 110$ ) were female. Their mean age was 23 years old. For this study, an online survey was created using Qualtrics, a professional website for creating online surveys. To collect data, online survey invitations were sent via email to students studying at a private university located in the southern region of Republic of Korea. Then, only students who agreed to participate and provide consent were selected as participants. Afterwards, they were asked to click on the “Proceed” button to complete the survey. For this study Rozy was selected as a virtual influencer because of her popularity among college students. Rozy is a virtual influencer,

meaning she is a computer-generated persona designed to look and behave as a real person on social media. She was created by a Korean entertainment company called Sidus in 2021 and has since amassed a significant following on social media platforms such as Instagram. Before answering questions (as shown in Appendix A), participants were given a chance to read about the virtual influencer, Rozy (as shown in Appendix B), whose profile contained photos, and to look over her recent advertising images. Their answers to survey questions were based on Rozy and her recent advertising endorsement. At the final section of the survey, participants were asked demographic questions such as their age and gender.

### 3.2. Measures

#### 3.2.1. Parasocial Interaction

Parasocial interaction with a celebrity endorser was measured using five items based on a study about parasocial relationships with celebrities on social media [47]. Parasocial interaction was measured on a 7-point scale anchored with “strongly disagree” and “strongly agree”. Some items included (1) I think I understand Rozy quite well; (2) I would like to have a friendly chat with Rozy; and (3) Rozy makes me feel comfortable, as if I were with a good friend. The reliability for this scale was 0.81.

#### 3.2.2. Perceived Human-Likeness

For measuring perceived human likeness, a 3-items scale was employed on a 7-point Likert scale where 1 = “strongly disagree” and 7 = “strongly agree” based on a study by Ho and MacDorman [48]. Three items were as follows: (1) The virtual influencer Rozy’s eye is realistic; (2) The virtual influencer Rozy’s skin texture is like humans’; (3) The virtual influencer Rozy’s eye-brow is like humans’. The reliability for this scale was 0.87.

#### 3.2.3. Perceived Authenticity

Perceived authenticity was measured on a 7-point scale anchored with 1 = “strongly disagree” to 7 = “strongly agree,” in response to five items which were developed by Choi and Lee [49]. Some items were as follows: (1) The virtual influencer Rozy is likely to provide differential contents based on her expertise; (2) The virtual influencer Rozy is likely to strive for her expertise with the help from her professional management agency; (3) The virtual influencer Rozy is likely to post contents in a consistent manner. The reliability for this scale was 0.79.

#### 3.2.4. Attitude toward Virtual Influencer

Attitude toward a virtual influencer was measured using 7-point scales for the following five semantic differential items: (1) 1 = “sincere” and 7 = “not sincere”; (2) 1 = “not credible” and 7 = “credible”; (3) 1 = “unbelievable” and 7 = “believable”; (4) 1 = “untrustworthy” and 7 = “trustworthy”; and (5) 1 = “not objective” and 7 = “objective” [50]. The reliability for attitude toward an endorsed political candidate was 0.81.

#### 3.2.5. Attitude toward Advertising

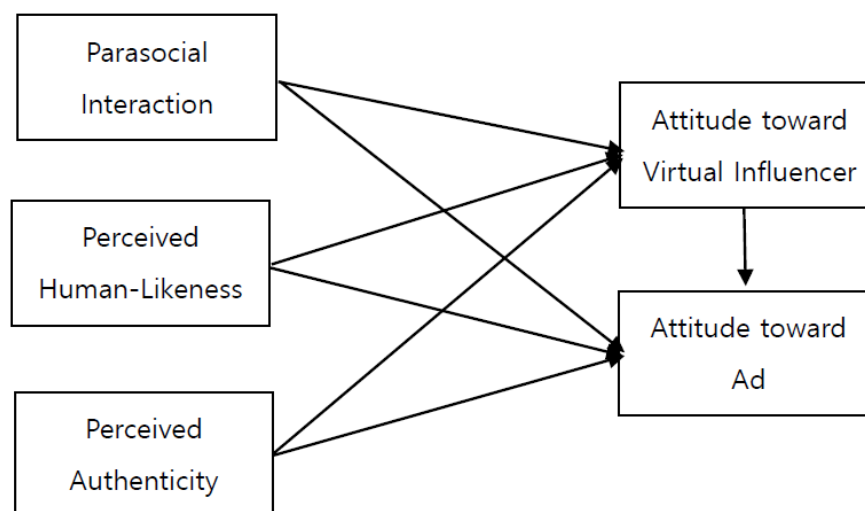
Attitude toward the advert was measured using the following three, 7-point semantic differential scales: (1) 1 = “very bad” and 7 = “very good”; (2) 1 = “very unfavorable” and 7 = “very favorable”; (3) 1 = “like very much” and 7 = “dislike very much” ( $\alpha = 0.95$ ) [51]. The reliability for this scale was 0.87.

## 4. Results

### 4.1. Hypothesis Testing

To test the research hypotheses as shown in Figure 1, a multiple regression analyses model was run to examine the impact of independent variables parasocial interaction, perceived human-likeness, and perceived authenticity on the dependent variables such as attitude toward a virtual influencer and attitude toward advertising.





**Figure 1.** Proposed Research Model.

#### 4.2. Impact of Parasocial Interaction on Attitude toward Virtual Influencer and Advertising

According to hypothesis H1a, having parasocial interactions with a virtual influencer will have a positive effect on one's attitude towards them. Table 1 displays the outcomes of a multiple regression analysis, where parasocial interaction is the independent variable and attitude towards the virtual influencer is the dependent variable. The regression model ( $R^2 = 0.294$ ) is significant at 0.000, indicating a significant and positive relationship between parasocial interaction and attitude towards the virtual influencer. The table also indicates that 29.4% of the variance in attitude towards the virtual influencer can be explained by parasocial interaction. The beta value for parasocial interaction (0.542) is also significant at 0.000.

**Table 1.** Regression results using parasocial interaction as the criterion for attitude toward virtual influencer.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.542	0.294	0.290	0.907	73.77	0.000	Accepted
Coefficients						
Unstandardized Coefficients		Standardized Coefficients				
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>	<i>sig.</i>		
2.144	0.219		9.802 **	0.000		
0.528	0.061	0.542	8.589 **	0.000		

Note: \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

Hypothesis H1b suggests that having parasocial interactions with a virtual influencer will have a positive impact on one's attitude towards an advertisement. Table 2 illustrates the outcomes of a multiple regression analysis, where parasocial interaction is the independent variable and attitude towards the advert is the dependent variable. The regression model ( $R^2 = 0.476$ ) is significant at 0.000, indicating a significant and positive relationship between parasocial interaction and attitude towards the advert. Table 2 also reveals that 47.6% of the variance in attitude towards the advert can be explained by parasocial interaction. The beta value for parasocial interaction (0.690) is also significant at 0.000. As a result, these findings support the acceptance of both H1a and H1b.

**Table 2.** Regression results using parasocial interaction as the criterion for attitude toward advertising.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.690	0.476	0.473	0.948	160.74	0.000	Accepted
Coefficients						
Unstandardized Coefficients		Standardized Coefficients				
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>	<i>sig.</i>		
0.713	0.228		3.122 *	0.002		
0.814	0.066	0.690	12.678 **	0.000		

Note: \* indicates  $p < 0.05$ ; \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

#### 4.3. Impact of Perceived Human-Likeness on Attitude toward Virtual Influencer and Advertising

Hypothesis H2a suggests that having a perception of human-like qualities in a virtual influencer will have a positive effect on one's attitude towards them. Table 3 displays the outcomes of a multiple regression analysis, where perceived human-likeness is the independent variable and attitude towards the virtual influencer is the dependent variable. The regression model (R square = 0.102) is significant at 0.000, indicating a significant and positive relationship between perceived human-likeness and attitude towards the virtual influencer. Table 3 also shows that 10.2% of the variance in attitude towards the virtual influencer can be explained by perceived human-likeness. The beta value for perceived human-likeness (0.320) is also significant at 0.000, suggesting that it has a strong influence on one's attitude towards the virtual influencer.

**Table 3.** Regression results using human-likeness as the criterion for attitude toward virtual influencer.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.320	0.102	0.097	1.025	20.18	0.000	Accepted
Coefficients						
Unstandardized Coefficients		Standardized Coefficients				
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>	<i>sig.</i>		
2.672	0.290		9.19 **	0.000		
0.272	0.061	0.320	4.492 **	0.000		

Note: \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

Hypothesis H2b suggests that having a perception of human-like qualities in a virtual influencer will have a positive impact on one's attitude towards an advertisement. Table 4 illustrates the outcomes of a multiple regression analysis, where perceived human-likeness is the independent variable and attitude towards the advert is the dependent variable. The regression model (R square = 0.098) is significant at 0.000, indicating a significant and positive relationship between perceived human-likeness and attitude towards the advert. Table 4 also indicates that 9.8% of the variance in attitude towards the advert can be explained by perceived human-likeness. The beta value for perceived human-likeness (0.312) is also significant at 0.000, indicating a strong influence on one's attitude towards the advert. As a result, these findings provide support for the acceptance of both H2a and H2b.

#### 4.4. Impact of Perceived Authenticity on Attitude toward Virtual Influencer and Advertising

Hypothesis H3a suggests that if a virtual influencer is perceived as authentic, it will positively influence one's attitude towards them. Table 5 presents the results of a multiple regression analysis with perceived authenticity as the independent variable and attitude towards the virtual influencer as the dependent variable. The regression model (R square = 0.310) is significant at 0.000, indicating a significant and positive relationship

between perceived authenticity and attitude towards the virtual influencer. Table 5 also shows that 31% of the variance in attitude towards the virtual influencer can be explained by perceived authenticity. The beta value for perceived authenticity (0.557) is also significant at 0.000, indicating a strong influence on one's attitude towards the virtual influencer.

**Table 4.** Regression results using parasocial human-likeness as the criterion for attitude toward advertising.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.312	0.098	0.093	1.243	19.15	0.000	Accepted
Coefficients						
Unstandardized Coefficients			Standardized Coefficients			
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>		<i>sig.</i>	
1.977	0.356		5.601 **		0.000	
0.322	0.074	0.312	4.376 **		0.000	

Note: \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

**Table 5.** Regression results using authenticity as the criterion for attitude toward virtual influencer.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.557	0.310	0.306	0.897	79.49	0.000	Accepted
Coefficients						
Unstandardized Coefficients			Standardized Coefficients			
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>		<i>sig.</i>	
0.129	0.460		0.281		0.779	
0.658	0.074	0.557	8.915 **		0.000	

Note: \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

Hypothesis H3b suggests that if a virtual influencer is perceived as authentic, it will positively influence one's attitude towards an advert. Table 6 displays the results of a multiple regression analysis with perceived authenticity as the independent variable and attitude towards the advert as the dependent variable. The regression model (R square = 0.488) is significant at 0.000, indicating a significant and positive relationship between perceived authenticity and attitude towards the advert. Table 6 also shows that 48.8% of the variance in attitude towards the advert can be explained by perceived authenticity. The beta value for perceived authenticity (0.488) is also significant at 0.000, indicating a strong influence on one's attitude towards the advert. Therefore, these results provide support for accepting both H2a and H2b.

#### 4.5. Impact of Perceived Authenticity on Attitude toward Virtual Influencer and Advertising

Hypothesis 4 suggests that a positive attitude towards a virtual influencer will lead to a positive attitude towards an advert. The results of the multiple regression analysis in Table 7 support this hypothesis, with a significant and positive impact of parasocial interaction on attitude towards the virtual influencer. The analysis shows that 32.3% of the variation in attitude towards the virtual influencer is explained by parasocial interaction, and that parasocial interaction (with a beta value of 0.569) is significant at 0.000. Overall, these results provide evidence for the acceptance of H4.



**Table 6.** Regression results using authenticity as the criterion for attitude toward advertising.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.488	0.239	0.234	1.148	55.47	0.000	Accepted
Coefficients						
Unstandardized Coefficients		Standardized Coefficients				
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>	<i>sig.</i>		
0.851	0.586		1.453	0.148		
0.699	0.094	0.488	7.448 **	0.000		

Note: \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

**Table 7.** Regression results using attitude toward virtual influencer as the criterion for attitude advertising.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.	Result
0.569	0.323	0.320	1.077	84.63	0.000	Accepted
Coefficients						
Unstandardized Coefficients		Standardized Coefficients				
<i>b</i>	Std. Error	<i>beta</i>	<i>t</i>	<i>sig.</i>		
0.757	0.305		2.480 *	0.014		
0.689	0.075	0.569	9.199 **	0.000		

Note: \* indicates  $p < 0.05$ ; \*\* indicates  $p < 0.01$ . A significant *b*-weight indicates the *beta*-weight and semi-partial correlations are also significant. *b* represents unstandardized regression weight. *beta* indicates the standardized regression weights.

## 5. Discussion

The current study found that parasocial interactions with a virtual influencer have a positive effect on one's attitude toward virtual influencers and their endorsed ads. This finding is consistent with prior research [52–55]. Study findings suggest that virtual influencers can also elicit feelings of attachment and familiarity among their audience, which can lead to parasocial interactions. In fact, some researchers have suggested that virtual influencers may be even more effective at eliciting parasocial interactions than human influencers because they are not subject to the same limitations as humans, such as aging or making mistakes [52–55].

Parasocial relationship is known to be formed when individuals develop a sense of intimacy with a celebrity or media personality. Prior research found that parasocial relationships have a great impact on people's attitudes. For instance, in a political communication context, Lammie [52] found that identification with a celebrity did serve to change opinions of both the endorsed candidate and the endorsing celebrity. In a health-communication context, identification and parasocial interaction with Angelina Jolie led to favorable attitude and behavior change [54]. Lastly, in a celebrity-endorsement context, Um [56] found that identification with a celebrity endorser resulted in favorable attitudes toward advertising and brands.

The theoretical implication of this study is that people develop parasocial relationships not only with humans but also with virtual influencers. From a practical implication perspective, this study suggests that virtual influencers can be designed to cater to specific audience demographics, making it easier for them to establish connections with their audience, and potentially leading to stronger parasocial interactions. However, it is important to note that virtual influencers are still a relatively new phenomenon, and more research is needed to fully understand the relationship between parasocial interaction and virtual influencers. Thus, marketing practitioners may use virtual influencers as an effective marketing strategy.

To date, the human likeness of virtual influencers can be manifested in appearance, thought, and emotions [26]. Prior research findings suggest that human likeness has a

positive impact on consumers' responses to products [56,57]. The current study investigated only the first of these aspects, finding that a virtual influencer possessing more of a human likeness had a positive impact on consumers' attitude toward it and toward the advert it appeared in. However, it is important to note that the impact of human likeness on the effectiveness of virtual influencers in advertising is not fully understood and there are still many factors that can influence the success of a virtual influencer campaign, such as the quality of the content, the target audience, and the overall strategy.

The finding supports the uncanny valley theory, which suggests that a human appearance or behavior can make an artificial figure seem more familiar to viewers. According to the uncanny valley theory, humanoid objects that imperfectly resemble actual human beings provoke uncanny or strangely familiar feelings of uneasiness and revulsion in observers [27]. It is also worth noting that an entity appearing to be almost human will risk eliciting cold, eerie feelings in viewers based on the uncanny valley theory. In this sense this study provides a practical implication for marketers. When it comes to creating a virtual influencer for marketing communication purposes, marketers should consider the level of human likeness a virtual influencer possesses so as to avoid negative reactions predicted by the uncanny valley theory.

This study corroborates what prior research has found in terms of the effects of authenticity in advertising [32,33]. Authenticity encompasses what is genuine, real, and/or true [58] and is associated with genuineness, reality, and truth [58]. Implementing authenticity marketing helps marketers express brand values and purpose. Thus, authenticity in advertising is deemed to be important. Findings from previous research suggest that authenticity has a positive impact on attitudes [32,33], consumers' attitude toward advertising and brands [32], and consumers' level of trust [59]. Similarly, this study has found that consumers' perceived authenticity positively affects attitude toward a virtual influencer and attitude toward advertising. When it comes to virtual influencers, perceived authenticity can be particularly important. Virtual influencers are still a relatively new phenomenon, and consumers may be skeptical about their authenticity and whether they are a genuine representation of a brand or simply a marketing ploy. To overcome this skepticism, virtual influencers must be designed and presented in a way that is authentic and believable. This can involve creating a backstory for the virtual influencer, giving them a personality and values, and having them interact with other users in a way that feels natural and organic.

## 6. Conclusions

In the current study, the author investigated factors which predict the effects of virtual influencer advertising. Two factors such as parasocial interactions and perceived authenticity have often been examined as predictors of effectiveness of celebrity endorsements [23,24,60]. Research on what effects these two factors produce in the context of virtual influencer advertising has been scarce. Thus, this research contributes to the growing body of knowledge on the effectiveness of influencer endorsement by exploring the phenomenon of virtual influencers, thus expanding the existing literature on the subject.

As any other research, this study also has several limitations. First, this study was conducted solely with university students as participants, which may limit its generalizability to the wider population. University students may hold different attitudes towards virtual influencers than older age groups or the general population, which could result in different study outcomes. Therefore, it would be valuable for future research to expand the sample demographically by including diverse age groups to investigate how consumers perceive virtual influencer in advertising. This would enhance the representativeness and generalizability of the study findings by incorporating a broader range of participants from the general population. Second, this study opted to use a genuine virtual influencer (Rozy) instead of a made-up one to provide participants with a more authentic experience. However, utilizing a real virtual influencer might introduce consumer bias when answering

survey questions. Thus, for a future study, it may be preferable to employ a fictitious virtual influencer to manage participants' pre-existing predispositions toward virtual influencers.

Some areas for further research in terms of virtual influencers in advertising include the impact on brand image, comparing virtual and human influencers, ethical concerns, and long-term impact. First, research could examine how the use of virtual influencers affects the image of the brands they represent. It would be interesting to examine whether the use of a virtual influencer has a positive or negative impact on brand reputation. Second, further research could compare the effectiveness of virtual influencers to that of human influencers. For example, does the use of a virtual influencer lead to greater engagement or sales than that of a human influencer, and under what circumstances? Third, there are ethical concerns associated with the use of virtual influencers. Further research could explore how consumers feel about these concerns and how they impact their attitudes towards the brands that use virtual influencers. Lastly, research could be conducted to examine the long-term impact of using virtual influencers in advertising. How do consumers' attitudes towards virtual influencers change over time, and how does this impact their purchasing behavior and loyalty to the brand? These new areas of research on virtual influences will extend our knowledge and understand when it comes to employing virtual influencers in advertising.

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**Institutional Review Board Statement:** The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of Hongik University.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Not applicable.

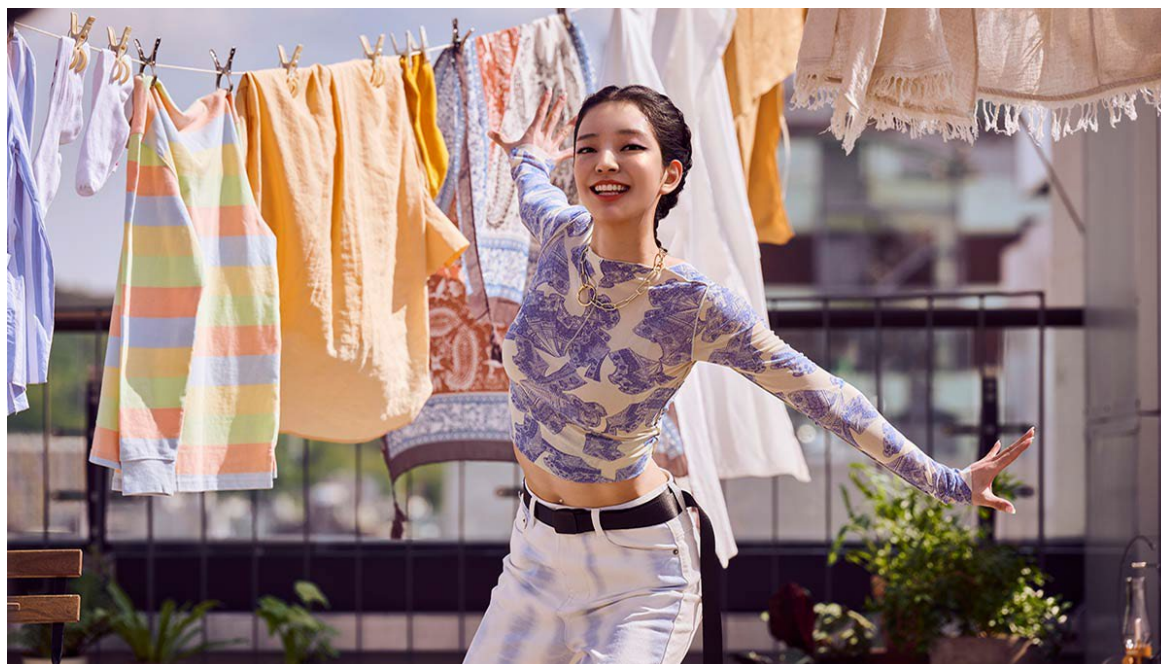
**Conflicts of Interest:** The author declares no conflict of interest.

## Appendix A

**Table A1.** Survey Items.

Scale	Items
Parasocial Interacton ( $\alpha = 0.81$ )	I think I understand Rozy quite well. I would like to have a friendly chat with Rozy. Rozy makes me feel comfortable, as if I were with a good friend.
Perceived Human-Likeness ( $\alpha = 0.87$ )	The virtual influencer Rozy's eye is realistic. The virtual influencer Rozy's skin texture is like humans'. The virtual influencer Rozy's eyebrow is like humans'.
Perceived Authenticity ( $\alpha = 0.79$ )	The virtual influencer Rozy is likely to provide differential contents based on her expertise. The virtual influencer Rozy is likely to strive for her expertise with the help from her professional management agency. The virtual influencer Rozy is likely to post contents in a consistent manner.
Attitude toward Virtual Influencer ( $\alpha = 0.81$ )	sincere—not sincere not credible—credible unbelievable—believable untrustworthy—trustworthy not objective—objective
Attitude toward Advertising ( $\alpha = 0.95$ )	very bad—very good very unfavorable—very favorable like very much—dislike very much

## Appendix B



**Figure A1.** Image of Virtual Influencer—Rozy.

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