

From Pixels to Purchases: The Role of Computer-Generated Imagery and Virtual Influencers in Digital Marketing

Kanchan Pranay Patil
Symbiosis Centre for Information
Technology
Symbiosis International (Deemed
University)
Pune, India
kanchan@scit.edu

Vijayakumar Bharathi. S
Symbiosis Centre for Information
Technology
Symbiosis International (Deemed
University)
Pune, India
svkbharathi@scit.edu

Abstract— Artificially created characters known as virtual influencers have millions of followers on social media and affect digital natives' engagement and decision-making in remarkable ways. This study identifies and conceptualizes six primary concepts of the TEARS model: trustworthiness, expertise, attractiveness, respect, similarity, impacting brand attachment, and Mimetic desire. Furthermore, we tested the impact of brand attachment and the mimetic desire of the followers toward purchase response as an outcome. This research's primary data comes from an online survey of 381 Instagram users. The result indicates a significant positive impact of virtual influencers' endorsement towards consumer purchase, with brand attachment and mimetic desire as the mediating variables. These findings extend the current knowledge on brand endorsement, influencer marketing, and virtual influencers in the artificial intelligence era. The study offers insights into improving brand attachments and produces implications to theory and practice for the efficacy of computer-generated imagery (CGI) for virtual influencers in advertising campaigns.

Keywords— virtual influencer marketing, TEARS Model, stimulus-organism-response, CGI, brand attachment, Mimetic desire, Customer Purchase Intentions

I. INTRODUCTION

Within the dynamic realm of digital marketing and social media, a new and noteworthy phenomenon has surfaced - the ascent of virtual influencers [1]. These computer-generated imageries (CGI), frequently indistinguishable from actual individuals, have significantly influenced online interaction and brand advertising [2]. The growing acceptance of endorsements using virtual influencers poses an important question. How do virtual influencers' recommendations impact on the buying intentions of customers?

With the increasing popularity of virtual influencers in the social media, it is relevant to study the effectiveness of their endorsement and its consequent impact on user behaviour. Traditional celebrity endorsements are disrupted by virtual influencers by distorting the differences between reality and virtuality [3]. In contrast the virtual Virtual complements personas that are digitally ai-driven curated to duplicate human behaviour [4].

This research examines the wonder of virtual influencers and seeks to understand the intricacies related with their stimulus on customer buying choices. Going into the digital future, it is imperative for companies to understand the psychological components the impact buying decisions response to virtual influencers [5]. The current study will explain the effect of virtual influencers on buyers' outlook to make decisions by analysing the engagement levels,

relatability and perceived authenticity, the virtual personalities generate.

At this juncture it is imperative to comprehend the distinctive ways in which virtual influencers influence buying decisions as they are poised to become integral elements of digital marketing strategies [6]. The digital transformation landscape of companies motivate researchers to investigate the inspiration of virtual influencers on buying intentions [7]. It is a subject of academic curiosity and a vital concern for businesses seeking to navigate the ever-changing realm of digital marketing. Fictionalized CGI persons built for social influence replace human influencers in large advertising campaigns. Virtual influencers are crucial to brand success, from Samsung to KFC to Vogue to fashion labels like Balmain, Louis Vuitton, Tommy Hilfiger, Marc Jacobs, and others. Virtual influencers are the new media frontier, the popular ones include, *Any Malu*, *Anna Cattish*, *Bermuda*, *bee influencer*, *Guggimon*, *Janky*, *Barbie*, *Lil Miquela*, *Lu do Magalu*, *Shudu*, and *Thalasya* among others [8].

The significance of customers' emotional attachment to a brand as a mediator in the context of purchase intentions via virtual influencers cannot be overstated. Buyers' attachment to a brand emotionally connects them virtual influencers to bring about engagement and loyalty. Therefore, the mediating role of brand attachment created by virtual influencers is essential for organisations to analyze their continuing customer relationships.

A. Research questions

This study investigates *how virtual influencers cultivate robust brand attachments and enhance customers' mimetic desires, thus facilitating a more comprehensive comprehension of purchasing decisions*. This study assesses the effectiveness of virtual influencers' product endorsements on social media by examining *how the product endorser's values and image coincide with the brand and how this influences customer reactions to the endorsement*.

B. Research Objectives

- To explore the significant factors of virtual influencers using Shimp's (2003) TEARS model that stimulates the Mimetic desires of consumers and their Brand attachment.
- To study the impact of Brand attachment and Mimetic desires on consumers' purchases.

II. REVIEW OF LITERATURE

A. Role of CGI in virtual influencer marketing towards brand attachment

Influencers have a prominent social standing and can impact buying behaviour through their expressions and actions [9]. Social media influencers communicate to encourage a target user groups with similar qualities and common likings [10]. These users often perceive virtual personalities to be genuine, and develop a bond with their followers. Companies leverage these influencers can to plan and share advertising messages, in a compelling and effective manner.

In the AI-driven digital marketing space, there is a confluence of computer-generated imagery (CGI), virtual influencer marketing, and brand attachment is an emerging research domain [11]. CGI, prominent for its futuristic graphics and intelligence capabilities, aids the creation of lifelike virtual effects, thereby distorting the physical and digital realms. CGI increases visual appeal and develops distinctive and engaging brand narratives [12]. The convincing aesthetic appeal and proficient storytelling develops brand loyalty—an emotional attachment superior to old-style marketing techniques.

The compelling and immersive nature of CGI-driven content enhances the emotional resonance, fostering a sense of familiarity and connection. For instance, Instagram's inclusive platform architecture enables individuals to easily garner attention, making it the preferred platform for influencer marketing [13]. Marketers (59%) choose influencers on Instagram over well-known celebrities because of their higher marketing effectiveness. Influencer marketing is one of the most rapidly developing tactics for acquiring new consumers through unique collaborations between brands and influencers [14].

B. Underlying theoretical model of TEARS and its relevance to virtual influencer marketing

The TEARS model, consisting of Trustworthiness, Expertise, Attractiveness, Respect, and Similarity, offers a complete framework for understanding the dynamics of virtual influencer marketing [15] [16]. Virtual influencers establish credibility through consistent dependability and steadfast integrity, fostering confidence in their endorsements. Expertise is a metric that gauges the perceived knowledge and proficiency of these digital personas in particular domains, hence enhancing their credibility. Attractiveness refers to the visual appeal and attractiveness of virtual influencers, which captivates the attention and engagement of the audience. Earning respect involves exhibiting ethical conduct and considering the audience's values. The concept of similarity emphasises the extent of relatability and shared characteristics between virtual influencers and their followers. Figure 1 displays the theoretical model.

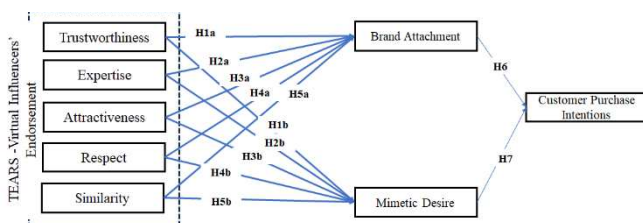


Fig 1: Theoretical Model

C. Brand Attachment

Brand attachment refers to the level of emotional connection that an individual has with a brand [17]. This emotional link substantially impacts how the brand is seen, the likelihood of making a purchase, and the potential for future loyalty. An influencer's engagement on social media can significantly influence the emotional attachment of their followers to the brand they are. Therefore, the hypotheses stated are as under.

H1a: Trustworthiness (TR) of virtual influencers positively influences Brand attachment (BA) of the consumers.

H2a: Expertise (EX) of virtual influencers positively influences Brand attachment (BA) of the consumers.

H3a: Attractiveness (AT) of virtual influencers positively influences Brand attachment (BA) of the consumers.

H4a: Respect (RS) for virtual influencers positively influences Brand attachment (BA) of the consumers.

H5a: Similarity (SM) of virtual influencers positively influences Brand attachment (BA) of the consumers.

D. Mimetic Desire

Mimetic desire refers to replicating someone else's desires, which can occur consciously or unconsciously [18]. Depending on the circumstances they possess a solid inclination to mimic the patterns of consumption exhibited by those with whom they share a close and personal bond. Social media influencers can strengthen their followers' tendency to imitate behaviours. Social media communities serve as platforms where prominent influencers discuss their personal lives and showcase their appealing qualities to their dedicated followers. In conjunction with the TEARS model, mimetic desire is crucial in virtual influencers. These influencers, who represent desirable lifestyles and trends, create a desire for imitation among customers. As a result, they affect consumers' purchase decisions and behaviours in virtual influencer marketing, which leads us to the following hypotheses.

H1b: The trustworthiness (TR) of virtual influencers positively influences the Mimetic desire (MD) of the consumers.

H2b: Virtual influencers' expertise (EX) positively influences consumers' Mimetic desire (MD).

H3b: Attractiveness (AT) of virtual influencers positively influences the Mimetic desire (MD) of the consumers.

H4b: Respect (RS) for virtual influencers positively influences the Mimetic desire (MD) of the consumers.

H5b: Similarity (SM) of virtual influencers positively influences the Mimetic desire (MD) of the consumers.

E. Customer Purchase Intentions

Both brand attachment and mimetic desire influence customer purchase intentions in the context of virtual influencers [19]. It reflects a complex relationship between emotional connection and aspirational emulation. Brand attachment evokes strong emotions, leading to loyalty and trust, which influences customers to prefer products that virtual influencers recommend. Concurrently, mimetic desire incites a longing to imitate, as consumers aim to replicate the lifestyles and choices exemplified by these digital personalities. Brand attachment and mimetic desire strongly influence customer buying choices, changing modern

consumer behaviours and preferences through the virtual influencer landscape.

H6: Brand attachment (BA) of the consumer positively influences customer purchase.

H7: Mimetic Desire (MD) of the consumer positively influences customer purchase (CP).

III. METHOD

Instagram is gaining increasing popularity in India, surpassing other social networking platforms. Therefore, Instagram users are the most suitable demographic for this research. Instagram users are predominantly those individuals who rely on technology for pleasure and fall within the age range of their twenties and thirties. Before commencing the survey, participants assessed a URL hyperlink leading to the brand-endorsed content of the virtual influencer. After that, a structured questionnaire was administered online to collect the responses. We used non-probabilistic purposive sampling, which led to a sample size of 381 users. The table displays the demographic characteristics of the respondents.

A. Instrument Development

The latent variables, which showed satisfactory reliability (Cronbach's $\alpha > 0.7$), were adapted from previous studies. The measurement of mimetic desire utilised four items, while brand attachment was measured using five items [20] [21]. Four questions were included to assess client buying behaviour [22] [23]. Attractiveness, trustworthiness, and similarity were assessed using a set of five items [24] [25]. Five items assessed work to assess proficiency and admiration [26]. The items were rated using seven-point Likert-type scales, where a rating of 1 indicated "strongly disagree" and a rating of 7 indicated "strongly agree."

The data was analysed using the PLS-SEM (Partial Least Square - Structural Equation Modelling) application. The sample size was calculated using the General Power Analysis Programme (G*Power). The Apriori power analysis utilised an effect size smaller than 0.10, a significance threshold of $\alpha = 0.05$, and a power level ($1 - \beta$) of 0.95 [27]. Therefore, 381 samples satisfactorily adequate..

IV. DATA ANALYSIS

The researchers employed the PLS algorithm to estimate the measurement and structural models using SmartPLS Version 4.0 (Partial Least Squares). The study assessed the measurement model by considering construct validity, which includes both convergent and discriminant validity and scale reliability. Table 1 presents the demographic data of the respondents.

Table 1: Respondents' Demographics

Demographic Data		No.	(%)
Gender	Male	178	47%
	Female	203	53%
Age	20-29	230	60%
	30-39	151	40%
Education	High School	126	33%
	UG	167	44%

	PG	88	23%
Social Media Usage	Instagram	381	100%
	YouTube	373	98%
	Facebook	376	99%
	Twitter	256	67%
Instagram Usage	Connect	356	93%
	Shopping	179	47%

A. Measurement Model

Convergent validity was evaluated using three criteria: (1) factor loadings beyond 0.70; (2) composite construct reliability (CR) surpassing 0.80; and (3) average variance extracted (AVE) larger than 0.50, as indicated in Table 2.

	TR	EX	AT	RS	SM	BA	MD	CP
TR	0.79							
EX	0.45 2	0.71 8						
AT	0.34 2	0.56 4	0.74 6					
RS	0.56 3	0.43 9	0.23 8	0.82 4				
SM	0.48 7	0.34 2	0.53 2	0.50 2	0.75			
BA	0.32 1	0.50 4	0.50 6	0.45 1	0.53 8	0.76 4		
MD	0.54 5	0.43 8	0.42 5	0.50 3	0.43 7	0.32 6	0.78 8	
CP	0.34 5	0.51 2	0.34 9	0.30 6	0.36 2	459	0.56 1	0.77 2

B. Structural Model

Using bootstrapping with 5000 subsamples, the researchers assessed the path importance in the structural model to evaluate the conceptual model. Figure 2 displays the findings from the structural model study. The R^2 (Coefficient of Determination) value for each endogenous construct is displayed in table 3 and table 4 indicates if the structural relationship is validated between the constructs.

Table 3: R^2 Results

Endogenous latent construct	R2
Brand attachment (BA)	0.448
Mimetic Desire (MD)	0.523
Customer Purchase (CP)	0.576

Table 4: Structural relationship between exogenous and endogenous constructs

Hypothesis	Relationship	β	t-statistic	Decision
H1a	TR- > BA	0.421	6.347***	Upheld
H1b	TR- > MD	0.416	7.147***	Upheld
H2a	EX- > BA	0.006	0.219	Not Upheld
H2b	EX- > MD	0.032	0.748	Not Upheld
H3a	AT- > BA	0.554	5.197***	Upheld
H3b	AT- > MD	0.496	1.765*	Upheld
H4a	RS- > BA	0.004	1.212	Not Upheld
H4b	RS- > MD	0.013	0.872	Not Upheld
H5a	SM- > BA	0.527	17.23***	Upheld
H5b	SM- > MD	0.481	2.895***	Upheld
H6	BA- > CP	0.671	3.563***	Upheld
H7	MD- > CP	0.563	5.121***	Upheld

V. FINDING & DISCUSSION

The study investigated the significant factors of virtual influencers using Shimp's (2003) TEARS model that stimulates the Mimetic desires of consumers and their Brand attachment. Further researchers investigated the impact of Brand attachment and Mimetic desires on consumers' purchases. The TEARS model explained the brand endorsement factors of virtual influencers on Instagram. In light of the findings in Table 3, the total effect of variables such as trustworthiness, Expertise, attractiveness, respect, and similarity on brand attachment was 44.8%, and 52.3% on mimetic desires. The effect of brand attachment and mimetic desires on customer purchase was 57.6%, enabling an understanding of the virtual influencer's endorsement.

The outcomes of the path analysis are shown in Table 4. The Findings were in line with H1a: ($\beta = 0.421$, t-value 6.347) virtual influencer's trustworthiness, H3a: ($\beta = 0.554$, t-value 5.197) virtual influencer's attractiveness, and H5a ($\beta = 0.527$, t-value 1.723) similarity with virtual influencers drives brand attachment positively. Increased attraction may come from prolonged exposure to positive information and images of virtual influencers. Frequent exposure to virtual influencers on Instagram creates an illusion of closeness as if they are the consumer's close friends in real life [28] (Chung & Cho, 2017). The virtual influencers are perceived as natural and provide a sense of familiarity towards the realistic media content in the virtual world [29].

Also, as per H1b: ($\beta = 0.416$, t-value 7.147) virtual influencer's trustworthiness, H3b: ($\beta = 0.496$, t-value 1.765) virtual influencer's attractiveness, and H5b ($\beta = 0.481$, t-value 2.895) similarity with virtual influencer's drives mimetic desires positively. These findings indicate that Virtual influencers frequently use persuasive visuals in their material. In order to foster a feeling of familiarity that helps develop rapport, they frequently appear in realistic settings and exhibit behaviours similar to those of their followers [9] [30].

It was interesting to note that virtual influencer's expertise effects on brand attachment as per H2a ($\beta = 0.006$, t-value 0.219) and expertise effect on mimetic desire as per H2b ($\beta = 0.032$, t-value 0.748) was found to be insignificant. Also,

respect for virtual influencer effects on brand attachment as per H4a ($\beta = 0.004$, t-value 1.212) and respect effect on mimetic desire as per H4b ($\beta = 0.013$, t-value 0.872) was found to be insignificant. Virtual influencers are supposed to possess desired traits comparable to those of genuine human influencers to function as brand endorsers. Virtual influencers, however, lack genuine experience (Expertise) and social standing (respect), unlike real human influencers. Even though they might present themselves as authorities in a particular area with captivating backstories and entirely created content, it is still debatable if they are genuine and reliable [9].

As per H6: ($\beta = -0.671$, t-value 3.563), brand attachment and H7: ($\beta = -0.563$, t-value 5.121) mimetic desires significantly impact customer purchases. Instagram offers interactive elements like following, commenting, liking, and sharing. Young followers find positive comments and likes, especially from people they respect and admire, can boost their self-esteem [31]. Deeper interactivity on Instagram allows a strong bond between followers and influencers that affects follower consumers' trust and purchases.

VI. IMPLICATIONS

A. Implications to Theory

Our study extended the application of the TEARS model to validate the endorsement of virtual influencers factors on brand attachment and mimetic desire. Further brand attachment and mimetic desire validated the Instagram users purchasing intentions induced by virtual influencers. The study significant ramifications for marketing strategies, around virtual influencers [30]. Trust plays a crucial role as audiences navigate the increasingly blurred boundary between reality and virtuality and want authentic interactions. Empathy, commonly linked to interpersonal communication, presents a difficulty for virtual influencers in expressing feelings that resonate with others. Emphasising the importance of authenticity, authors are encouraged to develop storylines that genuinely connect with their virtual selves. Relevance guarantees that information aligns with current societal trends and cultural subtleties. Social influence, a fundamental aspect of influencer marketing, necessitates virtual entities to participate in and actively motivate authentic dialogues. Adopting the TEARS concept not only improves the credibility of virtual influencers but also transforms the marketing environment in the digital sphere [16].

Although virtual influencers are often seen as knowledgeable, doubts about their influence on brand loyalty and imitative desires still persist, according to our study. The fact remains that the absence of real human encounters reduces the capacity for genuine connections, reducing the impact these organisations have on shaping consumer behaviour and cultivating enduring brand loyalty.

Our study finds that respect for virtual influencers does not always lead to a strong emotional connection to a brand or a desire to imitate their behaviour. Audiences may regard virtual entities as disconnected from real human experiences, which might impede the formation of emotional connections crucial for brand loyalty. Mimetic desire frequently arises from relatable human personalities, and the conceptualization of virtual influencers may lessen their influence in shaping consumer behaviour [18].

B. Implications to Practice

This research offers critical implications to practitioners and marketers, with the advent of virtual influencers. The digital influencing avatars offer a unique perspective to user engagement by applying advanced AI-driven digital technologies by being charismatic brand ambassadors [31] [32]. However, there are other complicated ramifications; marketers must skilfully navigate ethical deliberations about transparency and authenticity. Practitioners must adapt their ways to appropriately integrate the constantly evolving technology underlying virtual influencers and leverage artificial intelligence in their marketing strategies. Ensuring a careful equilibrium between innovation and ethical considerations is paramount, requiring a sophisticated approach to develop sustainable and successful partnerships between brands and buyer in a continuously growing digital landscape.

VII. CONCLUSION

To conclude, this research study, we first acknowledge the current limitations; it is cross-sectional and time specific. Therefore, as digital space evolves, it is important to extend the current research synthesizing marketing and computer-generated imagery (CGI) of virtual influencers, despite the promising potential they offer. Primarily, it is crucial to thoroughly analyse the ethical consequences associated with using virtual influencers. Further inquiries should comprehensively examine the lasting impact on consumer trust and perception. Moreover, the potential for excessive dependence on technology raises concerns about the weakening of genuine human interaction in marketing encounters. In future, a comprehensive longitudinal evaluation is required to determine the effectiveness of virtual influencers across different cultures and demographics to ensure inclusivity. In order to advance the issue, future studies should prioritise the improvement of ethical guidelines, taking into account cultural distinctions and exploring complex dynamics in human-AI interactions, specifically in the digital marketing field.

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