ANTHROPOMORPHISM AND AUTHENTICITY: EXPLORING THE DYNAMICS OF VIRTUAL INFLUENCERS IN CONTEMPORARY MARKETING

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ABSTRACT

This study investigates the influence of Virtual Influencers (VIs) on consumer behaviour and their implications for brands. The objective is to understand how consumers perceive and interact with VIs compared to traditional human influencers. Findings reveal that VIs offer unique advantages, including constant availability, adaptability, and cost-effectiveness, which can enhance brand engagement. However, concerns about authenticity, trustworthiness, and ethical implications persist. Utilizing anthropomorphism theory, the study demonstrates that brands can foster consumer connection and trust by imbuing VIs with human-like traits. Detailed analysis indicates that while VIs can effectively engage consumers, the perceived lack of authenticity poses a challenge. Nevertheless, when VIs are strategically integrated into marketing campaigns, they can significantly influence consumer behaviour and brand perception. Ultimately, these insights enable companies to develop targeted marketing strategies, leveraging VIs to shape consumer culture and brand narratives effectively. This research underscores the potential of VIs in modern marketing, providing a framework for brands to navigate the evolving digital landscape.

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1. INTRODUCTION

In an era characterized by relentless technological advancement and the ever-expanding digital landscape, the emergence of influencers has revolutionized brand promotion and consumer engagement. Traditional influencers, renowned for their human authenticity and intimate connections with followers, have long dominated social media platforms, exerting significant influence over opinions and behaviours (Jacks, 2023). However, the advent of Virtual Influencers (VIs) represents a disruptive shift in influencer marketing paradigms, challenging established norms (Douglas, 2022).

Unlike their human counterparts, VIs are artificially generated personas designed to replicate real humans, offering brands a novel avenue for online marketing (Conti et al., 2022). With their capacity to transcend the limitations of human influencers, VIs possesses distinct advantages, including constant availability, adaptability, and cost-effectiveness (Shen, 2024). This transformation in the influencer landscape has sparked debates concerning the impact of VIs on consumer behaviour and brand interactions (Carter, 2016).

Virtual influencers have become a critical marketing strategy for advertisers to reach their customers. Due to the high purchase interest generated by virtual influencer marketing, companies invest in VIs to endorse their products, aiming to enhance results and increase sales among customers. The content produced by VIs can influence purchase intention, defined as the desire to buy products promoted by VIs (Lou & Yuan, 2019). Several factors influence consumers, such as motivation, which drives them to consider the products they intend to buy, and their cognitive state during decision-making processes, which fosters attachment to the activities they engage in.

However, alongside the excitement surrounding this new frontier in influencer marketing, concerns have arisen regarding the authenticity, trustworthiness, and ethical implications of VIs. Anthropomorphism theory provides a critical framework for comprehending the intricate dynamics between humans and VIs. By infusing VIs with human-like traits and behaviours, brands seek to cultivate a sense of connection and trust among online audiences (Lim & Lee, 2023; Muniz et al., 2023). Yet, questions persist regarding the authenticity and trustworthiness of VIs in the digital age, prompting broader considerations about their impact on consumer attitudes and purchase intentions (Kim & Kim, 2021).

Attractiveness, authenticity, trustworthiness, and anthropomorphism are factors that can positively influence users' attitudes toward virtual influencers. Virtual influencers, described as computer-generated 3D characters, have been actively researched, especially in the field of marketing (Miao et al., 2022). Bergkvist and Zhou (2016) define attitudes toward virtual influencers as a person's positive or negative assessment of these digital personas.

Their life experiences and developed personalities represent the general public who have consciously or unconsciously decided to follow them as opinion leaders. Despite being predominantly corporate, these influencers are strong communicators with significant potential to connect with their audience. The lack of real-life experience differentiates symbolic influencers from real people, potentially limiting their ability to shape followers' opinions and influence them.

In addition to exploring the influence of VIs on consumer behaviour, this research endeavours to examine the potential implications for brands and marketers. By elucidating how consumers perceive and interact with VIs, companies can develop more targeted marketing strategies tailored to the digital realm. Moreover, investigating variables such as interaction comfort and intention to engage with VIs can offer valuable insights into consumer-brand interactions online. This deeper understanding can inform the creation of campaigns that resonate with audiences and drive desired outcomes.

Furthermore, this study aims to bridge existing research gaps by focusing on the unique role of anthropomorphism in shaping perceptions of VIs. By uncovering the psychological mechanisms underlying human responses to VIs, we can discern the nuanced ways in which virtual personas influence consumer attitudes and behaviours. Through rigorous empirical analysis, this research seeks to contribute to theoretical advancements in marketing, psychology, and technology, providing fresh perspectives on the evolving nature of influencer marketing in the digital age. Ultimately, by unravelling the complexities of human-VI interactions, this study strives to pave the way for innovative approaches that harness the full potential of VIs in shaping consumer culture and brand narratives.

By synthesizing relevant literature on these constructs, this study seeks to develop a comprehensive model revealing the underlying mechanisms driving consumer engagement with VIs. Through empirical analysis, the proposed model aims to advance theoretical understanding and offer practical insights for marketers navigating the evolving landscape of influencer marketing in the digital age.

2.   LITERATURE REVIEW

2.1 Theoretical Foundation

As digital marketing evolves, Virtual Influencers (VIs) have become increasingly important for brands. To understand how VIs effectively engages consumers, this study uses three theories: Parasocial Interaction Theory, and the Technology Acceptance Model (TAM). Each theory provides a different perspective on how VIs interacts with and influence their audience. By combining these theories, we aim to identify what makes VIs successful in digital marketing and offer insights for creating better marketing strategies.

2.1.1 Parasocial Interaction Theory

The Parasocial Interaction (PSI) Theory offers a compelling framework for understanding the intricate dynamics between consumers and Virtual Influencers (VIs). PSI, initially proposed by Horton and Wohl (1956), describes the one-sided relationships that individuals develop with media personas. These relationships are characterized by the perception of intimacy and friendship, despite the absence of real, reciprocal interaction. In the context of VIs, this theory translates to the perception of a relationship with a digital entity. VIs, designed to mimic human traits and behaviours, foster a sense of familiarity and emotional connection with their audience, making consumers feel as if they are interacting with a real person (Giles, 2002). The emotional bonds

formed through PSI can significantly influence consumer trust and behaviour, leading to higher levels of engagement and increased purchase intentions.

2.1.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), provides another pertinent framework for examining VIs. TAM is widely used to explain and predict user acceptance and usage of technology. It posits that two primary factors determine an individual's decision to accept and use a technology: perceived usefulness and perceived ease of use. In the context of VIs, perceived usefulness refers to how beneficial consumers find the VI in providing valuable content, product recommendations, or enhancing their online experience. Perceived ease of use relates to how easy and intuitive it is for consumers to interact with the VI, encompassing aspects such as user interface design and accessibility. Together, these factors influence consumers' attitudes towards VIs, affecting their behavioral intentions to engage with and accept these digital personas. By understanding and enhancing these factors, marketers can increase consumer acceptance and sustained engagement with VIs.

2.2 Model Development

Incorporating these two theories into the research framework allows for a comprehensive understanding of the dynamics surrounding VIs and their role in contemporary marketing practices. Four factors are suggested have a significant role in shaping the attitude toward VIs (perceived authenticity, attractiveness, authenticity, trustworthiness), while intention to engage and purchase is positively influenced by attitude and interaction comfort.

2.2.1 Role of Attractiveness in Attitude toward VIs

The role of attractiveness in shaping attitudes towards influencers has garnered attention within scholarly discourse (Torres et al., 2019). Moustakas et al. (2020) have proposed employing compelling personality traits to imbue VIs with human-like qualities, such as conflicts, aspirations, and challenges. Such a strategy aims to foster deeper emotional connections with followers, thereby expanding the affective bonds between VIs and their audience. Consequently, the increasing departure from robotic appearances among VIs adds to their appeal (Appel et al., 2020).

However, the underlying factors driving the appeal of VIs remain largely unexplored, prompting inquiry (Kádeková & Holienčinová, 2018) into whether VIs, characterized by their blend of realism and intrigue, could potentially replace human influencers. It is pertinent to note that commercial and legal considerations underscore the complexity of this transition.

H1. Attractiveness has a positive influence on attitude toward VIs

2.2.2 Role of Attractiveness on Interaction Comfort

The impact of attractiveness on interaction comfort, especially within the domain of VIs, is a multifaceted dynamic involving the attractiveness of the influencers themselves, the establishment of emotional connections, and the perceived genuineness, all of which significantly shape users' overall comfort levels and engagement with these digital personas (Yogeeswaran et al., 2016).

The allure of VIs lies in their ability to cultivate stronger emotional connections and foster a greater sense of comfort among users, thereby nurturing feelings of familiarity and connectedness (Young et al., 2011; Złotowski et al., 2015). The attractiveness of a persona can evoke positive emotions and a sense of intimacy, thereby enhancing comfort levels during digital interactions. Users tend to feel more at ease when engaging with attractive VIs, perceiving them as approachable and relatable, thus facilitating more meaningful and enjoyable interactions.

H2. Attractiveness has a positive influence on Interaction Comfort

2.2.3 Authenticity on Attitudes towards VIs

The significance of authenticity in shaping individuals' attitudes towards VIs cannot be overstated, as it profoundly impacts their perception, trust, and overall engagement with these digital personas. In this context, authenticity pertains to the extent to which VIs convey a genuine, transparent, and sincere portrayal of their identity, values, and experiences, thereby fostering a personal and emotional connection with their audience.

Authenticity plays a pivotal role in cultivating trust and credibility. When VIs is perceived as authentic, viewers are more inclined to trust the information, recommendations, and support they offer. This trust and credibility translate into heightened engagement, loyalty, and positive attitudes towards the influencer's content and the brands they endorse. Authenticity thus lays the groundwork for establishing a dependable and trustworthy digital presence.

Research investigating the impact of authenticity in advertising supports these assertions. Studies by Miller (2015), Cornelis and Peter (2017), as well as Schallehn et al. (2014), underscore the positive correlation between perceived authenticity in advertisements and attitudes towards them. These findings suggest that authenticity enhances consumer trust, leading to more favourable attitudes towards both advertising and the brands being promoted.

H3: The degree of authenticity exhibited by VIs significantly impacts attitudes towards them.

2.2.4 Role of Authenticity on Interaction Comfort

The influence of authenticity on people's attitudes towards VIs is an important factor that greatly influences their perception, trust, and overall engagement with these digital personas. Authenticity, in this context, refers to the degree to which VIs present a genuine, transparent, and honest depiction of their identity, values, and experiences, thereby creating a personal and emotional connection with their audience.

Authenticity breeds trust and credibility. When VIs are perceived as genuine, viewers are more likely to trust the information, recommendations, and support they provide. This trust and credibility results in increased engagement, loyalty and positive attitudes towards the influencer's content and the brands they endorse. Authenticity serves as the foundation for building a reliable and trustworthy digital presence.

In relation to the influence of authenticity in advertising, research findings show that the authenticity of an advertisement has a positive impact on attitudes (Schallehn et al., 2014) found that perceived authenticity increases the level of consumer trust, resulting in a positive attitude towards advertising. Similarly, Miller (2015) found that advertising authenticity positively influences consumers' attitudes toward advertising and brands.

H4: Authenticity positively affects interaction comfort, indicating that users' perception of VIs' genuineness enhances their comfort during engagements.

2.2.5 Trustworthiness on Attitude toward VIs

Trust plays a pivotal role in shaping attitudes towards VIs, significantly impacting users' perception, engagement, and interaction with these digital personalities. In this context, trust refers to the perceived reliability, credibility, and integrity of a VIs, influencing users' attitudes, beliefs, and behaviours towards the content and recommendations they provide.

When users perceive an influencer as trustworthy, they are more inclined to view the content and endorsements as authentic and dependable, fostering a positive attitude and confidence in the influencer's expertise and knowledge within their niche. This perception of credibility can lead to increased engagement, loyalty, and favourable attitudes towards both the influencer and the brands they promote. Furthermore, consumer trust in technology varies across age groups, with younger consumers exhibiting higher perceptions of technological competence and benevolence compared to senior consumers (Hallikainen et al., 2020). Additionally, trust in technology differs from trust in human interactions, especially in online settings where individuals may interact through avatars. Others' perceptions of trustworthiness towards avatars may not necessarily align with their perceptions of the individual VIs interacting through the avatar (Machneva et al., 2022).

H5: The level of trustworthiness attributed to VIs shapes individuals' attitudes towards them

2.2.6 Impact of Trustworthiness on Interaction Comfort

The impact of trust on interaction comfort, particularly in the realm of VIs, is a nuanced interplay between perceived reliability, emotional connection, and a sense of security, all of which profoundly affect a user's overall comfort and engagement with these digital personas. When users perceive an influencer as trustworthy, they feel more assured and at ease engaging with the content, confident that the information and recommendations provided are credible and genuine. This sense of reliability fosters a secure environment for users, promoting comfortable and reassuring digital interactions. Moreover, when influencers prioritize user engagement, actively respond to inquiries, and encourage meaningful interactions, users are more likely to feel comfortable expressing their opinions, sharing experiences, and participating in constructive discussions.

In the context of this research, trustworthiness is defined as the level of confidence and trust the audience places in the endorser when delivering the message, as noted by Amelina and Zhu (2016). Confidence plays a crucial role in establishing trust between the communicator and the recipient, serving as a fundamental foundation for belief. For mutual trust to be cultivated, the audience must perceive the message conveyed as authentic and impartial.

H6: Trustworthiness affects interaction comfort, indicating that users' perception of an influencer's reliability directly impacts their comfort during engagements.

2.2.7 Role of Anthropomorphism on Attitudes toward VIs

Anthropomorphism theory is vital for understanding how people perceive and interact with VIs, which are AI constructs mimicking human traits (Yang et al., 2023). By studying how individuals attribute human-like qualities to VIs, researchers uncover insights into audience emotional connections with these digital personas (Na et al., 2023). Anthropomorphism sheds light on the psychological mechanisms driving consumer responses to VIs, including trust, engagement, and purchase intentions (Malhotra & Ramalingam, 2023).

VIs, though designed to simulate human behaviour, may lack certain human features like changeable eye colour. Anthropomorphism involves attributing human qualities, such as emotions and reasoning, to non-human entities like robots (Waytz et al., 2014). This tendency is stronger when robots resemble humans, such as having a humanoid face (Aggarwal & McGill, 2007; Epley et al., 2007).

Anthropomorphism influences attitudes toward virtual influences by fostering a stronger emotional connection between the audience and the digital persona. When VIs exhibit human-like traits, individuals may feel a deeper sense of connection, leading to increased loyalty and engagement. The degree of similarity to humans in VIs, as highlighted by Miao et al. (2022), underscores their importance in creating relatable characters and offering insights into their social lives. This aligns with the uncanny valley theory, suggesting that anthropomorphic VIs is perceived as more trustworthy and credible. Moreover, individuals interact with human-like objects differently, attributing social norms to them despite recognizing their artificial nature.

H7: Anthropomorphism influences attitudes toward VIs.

2.2.8 Role of Anthropomorphism on Interaction Comfort

The impact of anthropomorphism on interaction comfort with artificial intelligence technology underscores the importance of natural embodiment and seamless interaction with the environment, mirroring human-like behaviours and understanding what humans deem significant. According to DiSalvo and Gemperle (2003), interaction comfort serves as the primary emotional catalyst for anthropomorphism. Similarly, Berger and Calabrese (1975) uncertainty reduction theory posits that individuals seek information about their counterparts during interactions to alleviate uncertainty about future behaviours. Psychological studies on cognitive processing reveal that when individuals experience neutral to positive emotions, they process cues with less scrutiny and adopt a more superficial thinking style compared to those experiencing stress-induced negative emotions like discomfort (Baron-Cohen et al., 1994; Bodenhausen et al., 1994). Therefore, the impact of turn-taking cues provided by metahuman services on consumers' perceived anthropomorphism is moderated by the perceived comfort of the interaction.

H8: Anthropomorphism significantly influences the level of interaction comfort experienced with artificial intelligence technology.

2.2.9 Attitude toward VIs Intention to Engage and Personal Preferences and Interests

The relationship between Attitude toward VIs and Intention to Engage is moderated by personal preferences and interests. Research indicates a positive influence of attitude on consumers' intention to engage (Bianchi & Andrews, 2018; Puspitasari, 2014). Users are more likely to engage if they hold a positive attitude towards influential VIs that align with their interests.

H9: Attitude toward VIs significantly impacts Intention to Engage, with personal preferences and interests acting as moderators

2.2.10 Attitude toward Virtual Influence, Intention to Engage and Personal Preferences and Interests

Interaction comfort plays a crucial role in shaping intentions to engage, particularly in human-computer or human-machine interactions. When users experience a sense of ease and comfort during interactions, they are more inclined to express their intentions to engage further. Simply put, comfortable interactions often lead to a desire for increased interaction with the system or technology. Customer comfort, as highlighted by Lloyd and Luk (2011), is closely tied to positive interactions. The ease of interactions can result in heightened user engagement and more favourable perceptions of the technology, consequently fostering higher intentions to interact or utilize the system in the future. Ultimately, convenient interactions tend to enhance user satisfaction and promote greater engagement.

H10: Interaction comfort positively influences intentions to engage, indicating that users experiencing greater comfort are more likely to engage further with the system or technology.

2.2.11 Role of Intention to Engage on Purchase Intention

The nature of VIs engagement (actively participating in discussions versus passively consuming content) may have a different influence on purchase intent. The study also found that customers interact with VIs on different levels and can connect with them intellectually and emotionally. These interactions positively influence purchase intentions and contribute to a series of informed choices. The level of interaction and emotional connection with VIs confirms that users prioritize their relationships with influencers over their work. Attitude has a positive effect on intention to engage (Bianchi & Andrews, 2018; Puspitasari, 2014), this shows that VIs directly influence purchase intentions when they build trust and credibility among consumers and influencers. Trust in VIs can mediate the relationship between engagement intentions and purchase intentions, which are developed through engagement, and act as a mediator between engagement intentions and purchase intentions. When people trust an influencer, they are more likely to follow their recommendations and make purchases. Active engagement may have a stronger influence on purchase intention.

H11: Intention to Engage directly influences Purchase Intention, indicating that the level of engagement with VIs shapes consumers' likelihood of making purchases.

Figure 1: VIs Engagement Model
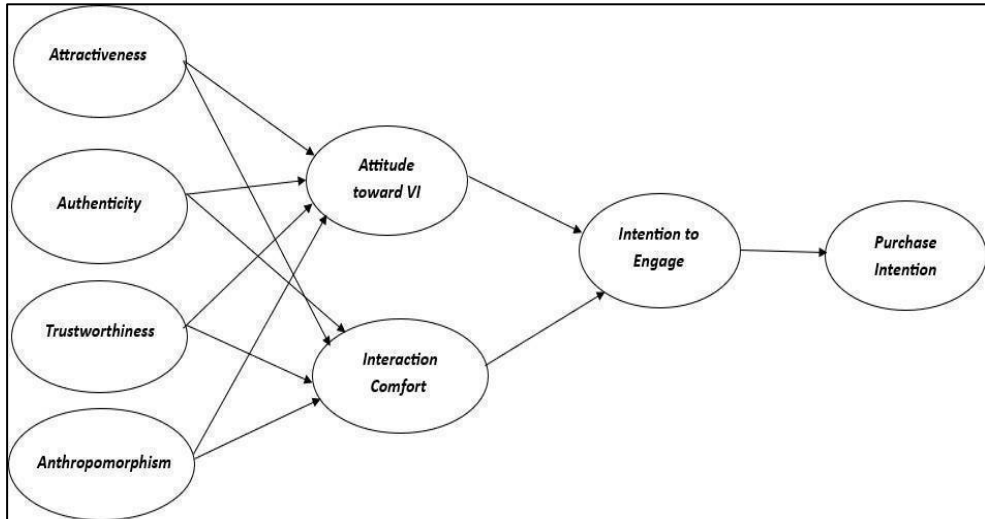
3.   METHODOLOGY

3.1 Sample and Collection

This quantitative study adopted a cross-sectional approach, examining data collected at a single point in time. Quantitative methods involve the analysis of numerical data to uncover patterns and relationships (Stockemer, 2019). This study falls under the category of quantitative research with an explanatory focus. In a cross-sectional design, both the predictor and outcome variables are observed simultaneously (Kesmodel, 2018). The research is associative, aiming to discern potential influences between the variables under investigation.

Data were collected through an online survey, chosen for its convenience for the researchers. The sampling method used in this study was purposive sampling. This method was selected because the research focuses on virtual influencer marketing, specifically requiring respondents who are familiar with virtual influencers. To ensure the data collected were relevant to the study, the questionnaire could only be completed by respondents who met the specified criteria. Data collection took place in Jakarta over 10 days. A total of 200 completed questionnaires were collected, of which 196 responses were deemed suitable for analysis.

3.2 Measures

Each item in the questionnaire was measured using a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Sekaran & Bougie, 2016). Eight variables were measured in this study, comprising a total of 59 items. The trustworthiness variable was measured using five items from Yoon and Kim (2016). The anthropomorphism variable was measured using six items from

Bartneck et al. (2009) and Timpano and Shaw (2013). Perceived interaction comfort was measured with six items from Evers et al. (2008). Attractiveness was assessed using seven items from Masuda et al. (2022), while authenticity was measured with seven items from Lee and Eastin (2021). Attitude toward virtual influencers was evaluated using seven items from Na et al. (2023). Intention to engage was measured with seven items from Bianchi and Andrews (2018), and purchase intention was assessed using seven items from Tran and Nguyen (2022).

This study employed SmartPLS to handle complex models with many variables and paths, allowing researchers to test intricate hypotheses. Given the relatively small sample size, the PLS technique was particularly useful for estimating complex models. PLS-SEM is also a tool with minimal limitations regarding measurement scales (Chang et al., 2016).

4. RESULTS AND DISCUSSION

The questionnaire was distributed via a Google form link shared with close relatives through platforms like WhatsApp and social media for about two months, and 200 responses were received. However, only 196 respondents met the criteria outlined for this study. Screening questions placed at the beginning of the questionnaire ensured that respondents met the research criteria.

4.1 Instrument Test Analysis

Because the data source for this study uses single source data from self-response questionnaires, testing the Common Method Variance (CMV) is crucial. Testing of CMV was carried out with full collinearity evaluation using SmartPLS. Based on the results in the table 1, it shows that all VIF values are < 5 so it can be concluded that the data does not have high collinearity. This shows that the variables used will not cause errors in assessing significance and weight estimation (Sarstedt et al., 2017)

Table 1: VIF Data

Indicator	VIF	Indicator	VIF	Indicator	VIF
AN1	2.204	AU1	1.524	PI1	3.342
AN2	2.718	AU2	1.814	PI2	3.186
AN3	3.518	AU3	2.032	PI3	3.587
AN4	3.289	AU4	1.833	PI4	4.204
AN5	2.058	AU5	1.904	PI5	4.659
AT1	1.738	IC1	3.810	TR1	2.146
AT2	2.447	IC2	4.882	TR2	3.013
AT3	1.882	IC3	3.461	TR3	2.605
AT4	3.057	IC4	3.412	TR4	2.113
AT5	2.068	IC5	3.239	TR5	2.266
ATV1	3.041	IE1	2.979		
ATV2	2.273	IE2	4.402		

Indicator	VIF	Indicator	VIF	Indicator	VIF
ATV3	2.408	IE3	3.811		
ATV4	2.247	IE4	3.083		
ATV5	2.430	IE5	3.066		

4.1.1 Validity Test

Table 2: Validity Test Result

Variable	Indicator	Factor Loading (>0,5)	AVE (>0,5)
Attractiveness	AT1	0.724	0.670
	AT2	0.841	
	AT3	0.808	
	AT4	0.895	
	AT5	0.815	
Authenticity	AU1	0.709	0.616
	AU2	0.78	
	AU3	0.82	
	AU4	0.796	
	AU5	0.813	
Trustworthiness	TR1	0.83	0.715
	TR2	0.882	
	TR3	0.853	
	TR4	0.817	
	TR5	0.845	
Anthropomorphism	AN1	0.822	0.740
	AN2	0.867	
	AN3	0.899	
	AN4	0.891	
	AN5	0.819	
Attitude Toward VIs	ATV1	0.869	0.704
	ATV2	0.777	
	ATV3	0.858	
	ATV4	0.833	
	ATV5	0.856	
Interaction Comfort	IC1	0.904	0.815
	IC2	0.929	
	IC3	0.898	
	IC4	0.895	
	IC5	0.887	

Variable	Indicator	Factor Loading (>0,5)	AVE (>0,5)
Intention to Engage	IE1	0.875	0.799
	IE2	0.922	
	IE3	0.907	
	IE4	0.882	
	IE5	0.883	
Purchase Intention	PI1	0.892	0.813
	PI2	0.888	
	PI3	0.901	
	PI4	0.91	
	PI5	0.918	

Validity testing was conducted with the participation of 196 respondents to assess the validity of each questionnaire item. The Average Variance Extracted (AVE) value was examined to ensure it exceeded 0.50, indicating acceptable validity. Additionally, convergent validity was evaluated through factor loading, with values above 0.50 considered valid. The results of the validity test were generated using SmartPLS version 4.0. Based on the results presented in Table. 2, all indicators have successfully met the validity test criteria. Each indicator exhibits a factor loading value exceeding 0.50, and all variables surpass the minimum AVE threshold of 0.50. Consequently, all instruments utilized in this study are deemed valid (Hair et al., 2019).

Table 3: Fornell-Larcker Criterion

	AN	AT	ATV	AU	IC	IE	PI	TR
AN	0.860							
AT	0.574	0.818						
ATV	0.822	0.600	0.839					
AU	0.770	0.651	0.781	0.785				
IC	0.844	0.639	0.856	0.797	0.903			
IE	0.741	0.642	0.772	0.668	0.821	0.894		
PI	0.743	0.537	0.801	0.712	0.849	0.817	0.902	
TR	0.754	0.570	0.792	0.754	0.806	0.781	0.804	0.846

Table 3 demonstrates that the square root of AVE surpasses the AVE values, indicating that the criteria for discriminant validity have been satisfied. This is evident from the comparison of values across variables. Firstly, for the Anthropomorphism (AN) variable, the square root value of AVE is 0.860, which exceeds the AVE value of 0.574. Similarly, in the case of Attractiveness (AT), the square root value of AVE is 0.818, surpassing the AVE value of 0.670. Furthermore, for Attitude Toward VIs (ATV), the square root value of AVE is 0.839, greater than the AVE value of 0.704. This trend continues across Authenticity (AU), Interaction Comfort (IC), Intention to Engage (IE), Purchase Intention (PI), and Trustworthiness (TR), with the square root values of AVE consistently exceeding their respective AVE values. As a result, it can be concluded that all variables meet the criteria for discriminant validity.

4.1.2 Reliability Test

The reliability test examines the composite reliability value and Cronbach's Alpha value, which should ideally exceed 0.60 to ensure reliability. All variables are declared reliable because the value of each construct has a Cronbach alpha greater than 0.7 ($\alpha > 0.7$) and an AVE with a value above 0.5 (AVE> 0.5) (Hair et al., 2019). (Table 4)

Table 4: Instrument Reliability Test

	Cronbach's Alpha	Composite Reliability
Attractiveness	0.876	0.892
Authenticity	0.843	0.848
Trustworthiness	0.900	0.902
Anthropomorphism	0.912	0.913
Attitude Toward VIs	0.895	0.904
Interaction Comfort	0.943	0.944
Intention to Engage	0.937	0.937
Purchase Intention	0.943	0.943

4.2 Measurement Model Test

Measurement Model test evaluates convergent validity, discriminant validity, and construct reliability. Figure 2. illustrates the results of the outer model calculations. The results of the partial least squares analysis reveal the Outer Weight/Loading values as part of the outer model analysis. Each indicator of the variables Attractiveness, Authenticity, Trustworthiness, Anthropomorphism, Attitude Toward VIS, Interaction Comfort, Intention to Engage, and Purchase Intention exhibits a loading factor value of > 0.50, indicating the validity of all indicators for these variables. Therefore, all indicators are deemed valid and retained in the model without exclusion.

Figure 2: Diagram of Outer Model Calculation Results
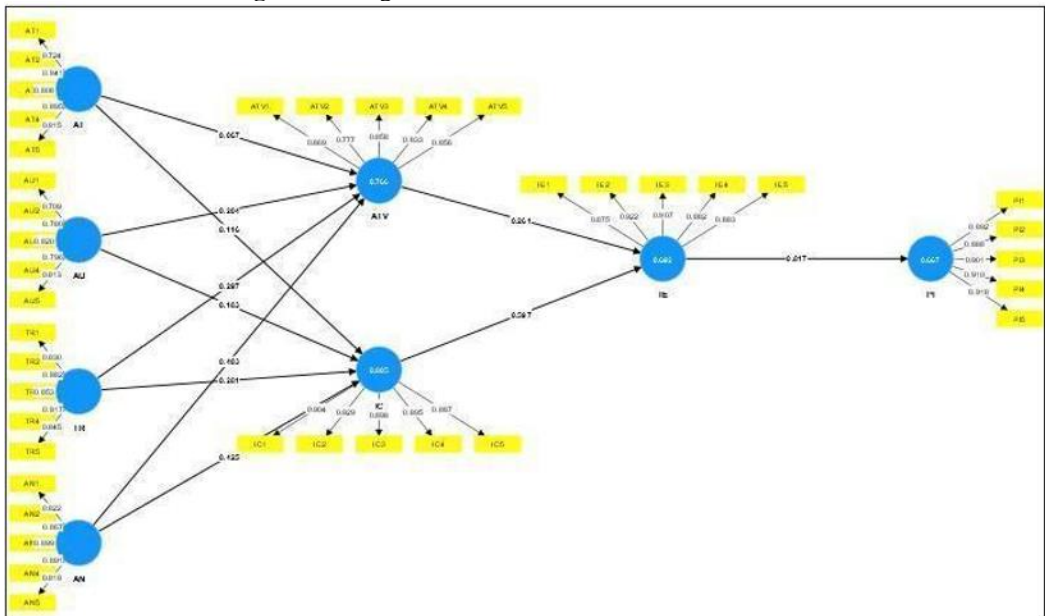
4.2.1 Evaluation of R Square Value

The R-Square test, also known as the determination test, assesses the magnitude of the influence of exogenous variables on endogenous variables. The R-Square value is expected to range between 0 and 1. The results of the R-Square value after data processing using SmartPLS 4.0. The result shows that four variables fall into strong category, namely Attitude Toward VIs (0.766), Interaction Comfort (0.805), Intention to Engage (0.692), and Purchase Intention (0.667). Based on the data, it can be seen that the r square value for all categorical variables is very high. However, even though the r square value is in the very high category, it will not interfere with measurements and multicollinearity problems because the multicollinearity value is <5 and it is stated that multicollinearity does not occur.

Table 5: R-square

Variable	R-square	R-square adjusted
Attitude Toward VIs	0.766	0.761
Interaction Comfort	0.805	0.801
Intention to Engage	0.692	0.689
Purchase Intention	0.667	0.666

4.2.2 Hypothesis Testing

Hypothesis testing was conducted using SmartPLS 4.0 with bootstrapping techniques applied to the data collected during the measurement stage. This testing, integrated into the structural model,

examines the hypothesized relationships through simulation. By employing the bootstrapping technique, the aim is to ascertain the direction and significance of the relationships for each latent variable. Hypothesis testing relies on the p-value, with a threshold set at $p \leq 0.05$. If the p-value exceeds 0.05, the hypothesis is not accepted. The results of the p-value after processing the data using SmartPLS 4.0 are presented in Table 6.

Table 6: p-*values* in the Coefficients path

	Hypot hesis	Mean (M)	STDEV	Statistic	P value	Confidence Interval (BC)		Effect Size (f²)	Result
						LL (2.5%)	UL (97.5%)		
AT->ATV	H1	0.073	0.049	1.368	0.172	-0.010	0.184	0.011	Rejected
AT->IC	H2	0.123	0.054	2.139	0.033	0.003	0.217	0.038	Accepted
AU->ATV	H3	0.211	0.073	2.802	0.005	0.058	0.338	0.053	Accepted
AU->IC	H4	0.181	0.082	2.241	0.025	0.033	0.352	0.052	Accepted
TR->ATV	H5	0.298	0.078	3.809	0.000	0.139	0.446	0.133	Accepted
TR->IC	H6	0.286	0.064	4.417	0.000	0.170	0.406	0.143	Accepted
AN->ATV	H7	0.390	0.082	4.931	0.000	0.265	0.565	0.232	Accepted
AN->IC	H8	0.415	0.088	4.846	0.000	0.262	0.586	0.311	Accepted
ATV->IE	H9	0.255	0.083	3.137	0.002	0.091	0.410	0.059	Accepted
IC->IE	H10	0.605	0.082	7.255	0.000	0.429	0.742	0.311	Accepted
IE->PI	H11	0.821	0.041	19.841	0.000	0.690	0.875	2.006	Accepted

Table 6 presents the results of hypothesis testing utilizing bootstrapping. The p-values table indicates that out of the eleven proposed hypotheses, ten were accepted while one was rejected. Specifically, Attractiveness (AT), Authenticity (AU), Trustworthiness (TR), Anthropomorphism (AN), Attitude Toward VIs (ATV), Interaction Comfort (IC), Intention to Engage (IE), and Purchase Intention (PI) variables were examined.

In this research there are directional and non-directional hypotheses, this is due to several factors, including the researcher's previous knowledge about the topic, existing theories, and specific research questions. If there is strong theoretical or empirical evidence to indicate the direction of the relationship, then a directional hypothesis may be more appropriate. However, if there is uncertainty about the direction of the relationship or if the goal is simply to determine whether a relationship exists, then a non-directional hypothesis may be more appropriate

4.3 Discussion

The research findings shed light on several key aspects of VIs marketing and its impact on consumer attitudes and interactions. Firstly, the study suggests that the attractiveness of VIs does not significantly affect individuals' attitudes toward them. This raises questions regarding the

underlying appeal of VIs, as highlighted by previous research (Appel et al., 2020). However, it is important to note that factors such as limited respondent profiles and prior exposure to VIs may contribute to this finding.

Contrary to its influence on attitude, attractiveness significantly influences interaction comfort. A positive perception of a VIs's appearance fosters a stronger emotional bond with the audience, facilitating more positive interactions. This aligns with research on the uncanny valley and anthropomorphism, suggesting that human-like attributes enhance comfort in interacting with virtual entities (Duffy, 2003).

Controlling for the influence of the chosen virtual influencer (VI) on the research results involves several considerations to ensure the validity and reliability of the study by establishing clear criteria for selecting the virtual influencer(s) included in the study can help control for variability. This might involve criteria such as follower count, engagement rates, content niche, or demographic characteristics of the virtual influencer's audience

Moreover, the study reveals that authenticity significantly influences interaction comfort. Authentic VIs, characterized by genuine behaviour and values, establish trust and foster meaningful interactions with users. Maintaining authenticity is crucial for influencers, as it enhances trust and positively shapes user expectations (Koles et al., 2024).

Trustworthiness emerges as a significant factor influencing individuals' attitudes toward VIs. Younger consumers, particularly those in the GEN-Z category, perceive trustworthy VIs more positively, reflecting their higher trust in technology (Hallikainen et al., 2020). This aligns with the notion that trust fosters positive attitudes toward influencer content.

Furthermore, trustworthiness significantly influences interaction comfort, creating a sense of safety and confidence in interactions with VIs. These results align with study of He et al. (2022). When users trust the integrity and intentions of VIs, they feel more comfortable engaging with their content. This underscores the importance of trust in fostering positive interaction experiences.

Anthropomorphism also plays a crucial role in shaping individuals' attitudes toward VIs. By imbuing VIs with human-like personalities and characteristics, anthropomorphism enhances user attraction and engagement. This finding supports the uncanny valley theory (Mori et al., 2012), suggesting that anthropomorphic VIs are perceived as more trustworthy and credible.

Finally, anthropomorphism significantly influences interaction comfort by creating a sense of familiarity and emotional connection in interactions with VIs. This finding aligns with DiSalvo and Gemprele (2003) study. When VIs exhibit human-like behaviour, users feel more comfortable and emotionally connected, enhancing the overall interaction experience. This underscores the importance of anthropomorphism in increasing comfort levels when interacting with virtual entities.

5. CONCLUSION

In conclusion, the study contributes to our understanding of VIs marketing by elucidating the complex interplay between attractiveness, authenticity, trustworthiness, anthropomorphism, and

their impact on consumer attitudes and interactions. These findings have implications for marketers and brands seeking to leverage VIs effectively in their marketing strategies.

This study contributes to theory by expanding our understanding of the factors that influence attitudes toward and interactions with VIs. Specifically, it sheds light on the roles of attractiveness, authenticity, trustworthiness, and anthropomorphism in shaping individuals' perceptions and behaviours in the context of VIs marketing. By empirically examining these factors, the study enriches existing theories such as the uncanny valley and anthropomorphism, providing insights into how these concepts apply to VIs. Additionally, the study addresses gaps in the literature by investigating the influence of these factors on both attitudes and interaction comfort, offering a comprehensive view of user engagement with VIs.

From a managerial perspective, the findings of this study offer valuable insights for marketers and brand managers seeking to optimize their VIs strategies. By understanding the differential impact of attractiveness, authenticity, trustworthiness, and anthropomorphism on attitudes and interaction comfort, marketers can tailor their influencer campaigns to better resonate with target audiences. For instance, emphasizing authenticity and trustworthiness in influencer content can enhance user engagement and foster positive brand perceptions. Additionally, leveraging anthropomorphic characteristics in VIs can create a sense of familiarity and emotional connection, leading to more comfortable and meaningful interactions with users. Overall, the study provides actionable recommendations for practitioners to design more effective VIs marketing campaigns that drive consumer engagement and brand success.

Influencer marketing can be a good strategy for reaching target audiences and influencing purchasing decisions. By leveraging the trust and credibility of influencers, brands can create a positive image that can increase sales. However, it is also important to consider the potential downsides. Let us explore the implications of influencer marketing for brands and various stakeholders. This introduction sets the stage by acknowledging the possibilities of influencer marketing while also pointing out its potential drawbacks.

While this study contributes valuable insights to the understanding of VIs marketing, several limitations should be acknowledged. The study did not consider contextual factors such as cultural differences, social norms, or platform-specific dynamics, which could influence individuals' perceptions and behaviours towards VIs. Accounting for these factors could provide deeper insights into the complexities of VIs marketing

Future research in the field of VIs marketing could explore several avenues to address the limitations and expand our understanding of this emerging phenomenon such as qualitative research. We suggest to incorporate qualitative research methods such as interviews, focus groups, or ethnographic studies can offer deeper insights into the underlying motivations, preferences, and perceptions of individuals engaging with VIs. Qualitative approaches can provide rich, nuanced data that complement quantitative findings.

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