



The role of anthropomorphism in human-like virtual influencers as social media endorsers on experience satisfaction and purchase intention on social media

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ABSTRACT

Background: The rapid advancement of technology has encouraged the integration of Artificial Intelligence (AI) across sectors, including the use of virtual influencers as social media endorsers in Indonesia. This study analyzes the effect of Virtual Influencer's Perceived Anthropomorphism on Satisfaction With Experience and Purchase Intention, mediated by Social Presence, Cognitive Response (Credibility and Perceived Usefulness), and Affective Response (Perceived Enjoyment and Flow) among Gen Z consumers in Indonesia, focusing on Arbie Seo, a trending Indonesian virtual influencer. **Methods:** Data were collected online through a structured questionnaire from 479 Gen Z respondents who had seen Arbie Seo's promotional content, then analyzed using Structural Equation Modelling (SEM) in AMOS. **Findings:** Virtual Influencer's Perceived Anthropomorphism, Social Presence, Perceived Usefulness, and Perceived Enjoyment significantly affect Satisfaction With Experience, which in turn significantly affects Purchase Intention, while Credibility and Flow show no significant effect. **Conclusion:** These findings underline the importance of social presence and cognitive-affective responses to virtual influencers in shaping consumers' satisfaction and purchase intention, offering companies guidance in selecting virtual influencer characteristics for product endorsement. **Novelty/Originality of this study:** This study offer the added value of the role of virtual influencer perceived anthropomorphism on social media in Indonesia.

KEYWORDS: cognitive & affective response; purchase intention; satisfaction with experience; social presence; virtual influencers' perceived anthropomorphism.

1. Introduction

Global technological developments have seen rapid progress in recent years, particularly in Artificial Intelligence (AI), the Internet of Things (IoT), Virtual Reality (VR), and metahuman technology. The integration of AI into various sectors, including digital marketing, opens up new opportunities for businesses in Indonesia to strengthen their online presence and engage with customers (Nair & Gupta, 2021). We Are Social (2023) reported that active social media users in Indonesia reached 167 million people, or 60.4% of the population. Research by the Indonesian Internet Service Providers Association (2024) showed that Generation Z dominates social media users, accounting for 34.4%. This situation has encouraged various companies to innovate in promotional strategies, one of which is through virtual influencers.

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One trending virtual influencer in Indonesia is Arbie Seo, who actively uploads content on several social media platforms such as Instagram, TikTok, and YouTube. According to social actor theory (Nass & Moon, 2000), people tend to assign social attributes such as emotions to non-human computer-generated objects, including virtual influencers, a phenomenon known as anthropomorphism. Anthropomorphism in virtual influencers can create a social presence that strengthens positive perceptions and consumer satisfaction (Aggarwal & McGill, 2007; Pelau et al., 2021) and elicits cognitive and affective responses from consumers (Kim et al., 2020). Although the trend of virtual influencers continues to grow, research focusing on the characteristics of virtual influencers that can create experiential satisfaction and drive purchase intentions is still limited.

This research complements previous studies that focused solely on the influence of virtual influencer anthropomorphism on satisfaction with experience, by adding the variable of purchase intention as a consequence of this influence. This research focuses on Arbie Seo's role as a virtual influencer in influencing satisfaction with experience, which drives purchase intention for the promoted product, within the scope of Generation Z consumers, the largest social media user group in Indonesia. Based on this description, this study seeks to answer the following questions, (1) does virtual influencers' perceived anthropomorphism influence satisfaction with experience? (2) what factors influence this relationship? (3) whether there is a mediation of social presence, perceived usefulness, credibility, perceived enjoyment, and flow in this relationship; and (4) whether satisfaction with experience influences purchase intention.

1.1 Virtual influencer's perceived anthropomorphism (VIPA)

This study presents significant theories, specifically the theory that computers function as social actors and the theory of anthropomorphism, which positively impacts technology. The computer as social actors theory (Nass & Moon, 2000) posits that individuals utilize identical social heuristics for computers as they do for human interactions, as computers possess analogous social characteristics to humans. This hypothesis is further corroborated by the concept of role anthropomorphism (Kim et al., 2024), which highlights that individuals (humans) may encounter a blend of emotions, such as coldness and peculiarity, when engaging with anthropomorphic virtual influences. From a socio-psychological viewpoint, Epley et al. (2007) and Golossenko et al. (2020) propose the concept of anthropomorphism, which involves attributing social characteristics (including physical traits, mental conditions, emotions, sentiments, and human-like actions) to non-human entities like robots, objects, and brands. From the perspective of cognitive perception and stimulus theory, anthropomorphism is defined as an individual's conviction that a non-human entity possesses human attributes (Nass & Moon, 2000), while it also denotes the degree to which a non-human entity exhibits human-like traits and behaviors (Kim et al., 2023; Murphy et al., 2021). Epley et al. (2007) contend that three key determinants of anthropomorphism exist, comprising one cognitive element, specifically agent knowledge, and two motivational elements, namely effectiveness and sociality. Consistent with these views, humans are increasingly regarding robots as social entities, fostering social connections and utilizing them as social resources for certain objectives (Sauppé & Mutlu, 2015). The personification of non-human entities is progressively infiltrating the realms of commerce and marketing, exemplified by the anthropomorphism directed at technology, including the prevalent engagement with non-human technologies like chatbots (Blut et al., 2021), social robots (Duffy, 2003), and virtual influencers (Deng and Jiang, 2023).

Human-like behaviors such as visual appearance, facial expressions, language, and social behavior are strong references for the perception of anthropomorphism, especially in eliciting consumer responses to non-human entities such as robots, chatbots, and other artificial intelligence (Blut et al., 2021; Epley et al., 2007). This suggests that anthropomorphism is key to both human interaction and human perception of computers and technology. To gain consumer acceptance, artificial intelligence devices need to be anthropomorphized (Pelau et al., 2021), which also applies to the implementation of virtual

influencers on social media. Virtual influencers are online celebrities who originate from non-human entities or are part of artificial intelligence designed with human-like features such as appearance, traits, and behavior (Lou et al., 2022; Thomas & Fowler, 2021). Assigning social attributes or the perception of anthropomorphism to virtual influencers can attract the public as an audience to interact and perceive these virtual influencers as real people. Anthropomorphizing virtual influencers in social media environments, combining elements of both virtual and real-world experiences, has the potential to foster implicit product preferences based on endorser credibility and overall brand perception (Ham et al., 2023). Furthermore, displaying social attributes can increase people's positive perceptions of virtual influencers as sociable or personable (e.g., Nass et al., 1997). Based on this description, this study proposes the following hypothesis, H1: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Satisfaction with Experience. H2: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Social Presence. H3: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Perceived Usefulness. H4: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Credibility. H5: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Perceived Enjoyment. H6: Virtual Influencers' Perceived Anthropomorphism has a significant effect on Flow.

1.2 Social presence

The context of social presence describes an entity's ability to convey social messages in commerce activities that are closely related to consumer behavior through the formation of a clear identity (Vázquez-Cano et al., 2023). To improve the customer experience of purchasing services, companies establish a sense of community with customers to encourage interactions and positive perceptions of the brand. The sense of community created between the entity representing the brand and customers reflects the concept of social presence (Biocca & Harms, 2002), where the entity in question can be a human or an AI-powered system such as a virtual influencer (Edwards et al., 2016). A strong social presence created by a virtual influencer can generate greater interest among the audience (Fogg & Tseng, 1999), establish good communication quality (Hassanein & Head, 2007; Liebrecht et al., 2020), and increase audience satisfaction and trust in a brand (Abeele et al., 2016; Cyr et al., 2007). Therefore, social presence has a big impact on the interaction between humans and virtual influencers. This non-human entities endowed with human-like attributes can create a social presence through verbal and nonverbal cues such as facial gestures, voice, and body movements (Gunawardena & Zittle, 1997), as well as through a sense of community with customers. A strong social presence in virtual influencer anthropomorphism can increase audience satisfaction and trust in a brand (Abeele et al., 2016; Cyr et al., 2007). Therefore, this study proposes the following hypotheses: H7: Social Presence significantly influences Perceived Usefulness. H8: Social Presence significantly influences Credibility. H9: Social Presence significantly influences Perceived Enjoyment. H10: Social Presence significantly influences Flow. H11: Social Presence significantly influences Satisfaction With Experience. H17: Social Presence mediates the influence of Virtual Influencers' Perceived Anthropomorphism on Satisfaction With Experience. Perceived usefulness is a crucial factor in shaping consumer experience satisfaction by triggering attitudes and shopping intentions toward brands that employ virtual influencers (Li & Wang, 2022; Pillai et al., 2020; van Pinxteren et al., 2019; Mardiana et al., 2022; Hsu et al., 2013). As part of the cognitive response (Kim & Lee, 2020), perceived usefulness is assumed to mediate the influence of virtual influencer anthropomorphism on customer experience satisfaction, thus formulating: H12: Perceived Usefulness has a significant effect on Satisfaction With Experience. H18: Social Presence and Perceived Usefulness mediate the influence of Virtual Influencers' Perceived Anthropomorphism on Satisfaction With Experience. Credible virtual influencers can significantly increase customer satisfaction with the experience (Shamim & Islam, 2022), and credibility is a key factor influenced by the social presence of virtual influencers (Melnychuk et al., 2024) as part of consumers'

cognitive responses (Wang et al., 2023). Alboqami (2023) stated that virtual influencer credibility, coupled with product authenticity, can create experiential satisfaction with the information received. Thus, the following hypotheses are formulated: H13: Credibility has a significant effect on Satisfaction With Experience. H19: Social Presence and Credibility mediate the effect of Virtual Influencers' Perceived Anthropomorphism on Satisfaction With Experience.

1.3 Perceived enjoyment

Consumer enjoyment plays a crucial role in creating experiential satisfaction with a technological system because consumers often use technology for entertainment (Davis et al., 1992). Huang et al. (2021) identified perceived enjoyment as a consumer's affective experience after interacting with a virtual influencer, which is closely related to their social presence (Fu & Kim, 2019). Davis et al. (1992) stated that perceived enjoyment is one of the determining factors of consumer behavior in technology acceptance. Perceived enjoyment can be defined as a pleasant feeling that arises when using or viewing a particular activity regardless of the resulting outcome (Venkatesh, 2000). Studies on perceived enjoyment indicate that the enjoyment felt by users can influence their satisfaction with a system experience because consumers sometimes use technology to seek entertainment and pleasure rather than to gain benefits (Davis et al., 1992). This demonstrates the role of enjoyment as a significant predictor of consumer satisfaction in the context of technology, including virtual influencers. Huang et al., (2021) identified perceived enjoyment felt by consumers as an affective experience after they interact with service robots in the hospitality and tourism sector. In the context of advertising and credibility, research shows that perceived enjoyment felt by consumers is closely related to new marketing strategies involving technology and interactive and innovative approaches (Hussain et al., 2020). Therefore, perceived enjoyment in virtual influencers as social media endorsers is very important in shaping customer experience satisfaction. Therefore, the following hypothesis is formulated: H14: Perceived Enjoyment has a significant effect on Satisfaction With Experience. H20: Social Presence and Perceived Enjoyment mediate the effect of Virtual Influencers' Perceived Anthropomorphism on Satisfaction With Experience.

1.4 Flow

The experience of flow refers to a state of consumer engagement in an action that is positively entertaining (Bressler & Bodzin, 2013) and motivating and joyful (Moneta & Csikszentmihalyi, 1996). Flow is a key predictor of human-computer interaction that triggers social presence and captures consumer attention (Skalski & Tamborini, 2007; Kim et al., 2020). As a factor related to social presence in robotics and media contexts (Shin & Choo, 2011), flow is a key predictor of human-computer interactions and computer-mediated environments in virtual areas (Novak et al., 2000), virtual agents (Baabdullah et al., 2022), and computer games (Murphy et al., 2008). The computer environment in the virtual area here can be interpreted as the virtual agent environment in social media. The sense of social presence that exists in flow in virtual media can attract consumers' attention to virtual agents such as virtual influencers (Skalski & Tamborini, 2007). Kim et al. (2020) also revealed that the flow factor can positively influence consumer satisfaction with digital media experiences such as social media, digital games, and online learning. Based on the flow theory perspective, consumers who experience positive flow experiences through interactive digital platforms such as social media have a greater chance of becoming emotionally engaged with virtual agents, thus establishing effective communication between the two. Therefore, the following hypothesis is formulated: H15: Flow has a significant effect on Satisfaction With Experience. H21: Social Presence and Flow mediate the effect of Virtual Influencers' Perceived Anthropomorphism on Satisfaction With Experience.

1.5 Satisfaction with experience

In the context of virtual experiences, consumer satisfaction with the service received can drive purchase intention. To create customer satisfaction, companies or brands need to identify the factors that can create that satisfaction. In the context of using AI technology, Brill et al. (2019) suggested that human-like virtual influencers can positively influence customer satisfaction through social responses and personalization. The presence of anthropomorphism in virtual agents can also generate higher satisfaction than robots without social attributes. Furthermore, it is worth noting that consumer expectations can be satisfied through the experience of interacting with digital assistants (Brill et al., 2019). This condition indicates that social presence through interactions created by virtual agents such as virtual influencers can encourage satisfaction with the experience in consumers, especially in their presence on social media (Pelau et al., 2021). Therefore, H16: Satisfaction With Experience has a significant effect on Purchase Intention.

2. Methods

This study employed a conclusive design with a descriptive approach and a single cross-sectional method, collecting data from a single sample population. The research model adapted the models of Kim & Park (2024) and Nawres et al. (2024), adding a purchase intention variable to examine the influence of virtual influencers on a company's potential Return on Investment (ROI). This study examined the relationship between virtual influencers' perceived anthropomorphism, satisfaction with experience, and purchase intention, mediated by social presence, perceived usefulness, credibility, perceived enjoyment, and flow, through 21 hypotheses depicted in the research model (Figure 1).

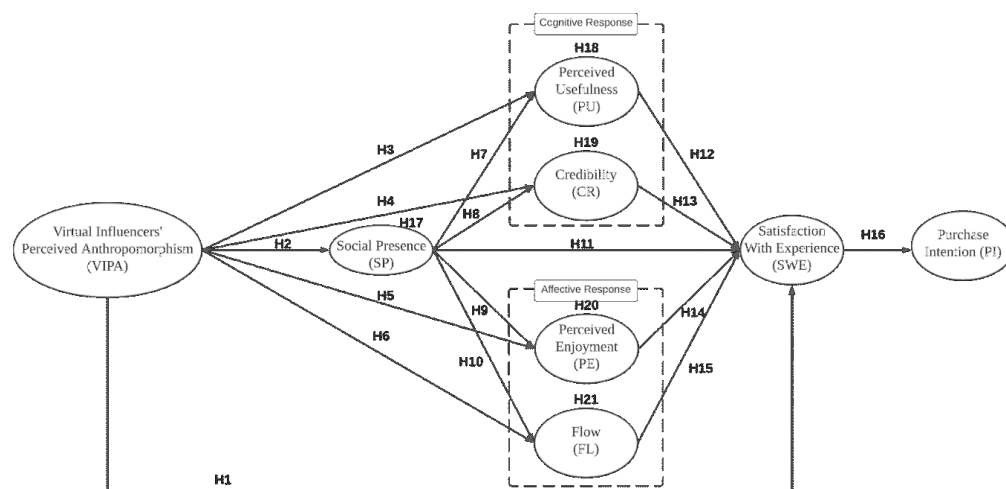


Fig. 1. Research model

Data collection was conducted online using a structured questionnaire to obtain specific primary data. The target population was Generation Z individuals aged 17–27 who resided in Indonesia, were social media users, and had viewed product promotional content by Arbie Seo. The questionnaire consisted of four sections: introduction and informed consent, screening questions, core questions based on indicators in reference journals with a Likert scale of 1–6, and respondent profiles. The collected data from 479 respondents was processed using Structural Equation Modeling (SEM) using AMOS software. Relationships between constructs were tested through structural model analysis, consisting of a Structural Model Goodness-of-Fit Analysis and a Causal Relationship Test based on t-values and p-values. For a one-tailed hypothesis, the hypothesis was accepted if the t-value was ≥ 1.645 or ≤ -1.645 and the p-value was < 0.05 (Hair et al., 2010). Mediation testing was conducted by examining the indirect effect through bootstrapping at a 95% confidence interval.

3. Results and Discussion

3.1 Respondent characteristics

Data collection results indicate that the questionnaire was completed by 28.60% male respondents and 71.4% female respondents, all of whom were Generation Z aged 17–27, meeting the target criteria. Based on domicile, the majority of respondents resided in Java (outside Greater Jakarta) at 29.44%, followed by Greater Jakarta at 19%. Based on occupation, the majority of respondents were students (40.92%) and private sector employees (28.60%). In terms of consumer behavior, the majority of respondents used social media for 1–3 hours per day (50.1%), with TikTok (40.5%) and Instagram (36.7%) as the platforms that most influenced purchasing decisions.

3.2 Validity and reliability testing

The results of the main-test validity and reliability testing (Table 1) showed that all indicators had factor loadings >0.5 , indicating validity. The Composite Reliability (CR) value for all variables was also ≥ 0.70 (Hair et al., 2007), indicating that all variables and indicators in this study were declared valid and reliable.

Table 1. Validity and reliability test of the main test

Variable	Indicator	Factor Loadings	Composite Reliability	Information
Virtual Influencers' Perceived Anthropomorphism	VIPA1	0.751	0.782	Valid & Reliabel
Virtual Influencers' Perceived Anthropomorphism	VIPA2	0.635	0.782	Valid & Reliabel
Virtual Influencers' Perceived Anthropomorphism	VIPA3	0.583	0.782	Valid & Reliabel
Virtual Influencers' Perceived Anthropomorphism	VIPA4	0.686	0.782	Valid & Reliabel
Social Presence	SP1	0.634	0.767	Valid & Reliabel
Social Presence	SP2	0.676	0.767	Valid & Reliabel
Social Presence	SP3	0.654	0.767	Valid & Reliabel
Social Presence	SP4	0.628	0.767	Valid & Reliabel
Perceived Usefulness	PU1	0.621	0.762	Valid & Reliabel
Perceived Usefulness	PU2	0.693	0.762	Valid & Reliabel
Perceived Usefulness	PU3	0.716	0.762	Valid & Reliabel
Credibility	CR1	0.770	0.836	Valid & Reliabel
Credibility	CR2	0.745	0.836	Valid & Reliabel
Credibility	CR3	0.743	0.836	Valid & Reliabel
Credibility	CR4	0.746	0.836	Valid & Reliabel
Perceived Enjoyment	PE1	0.742	0.869	Valid & Reliabel

Perceived Enjoyment	PE2	0.750	0.869	Valid & Reliabel
Perceived Enjoyment	PE3	0.731	0.869	Valid & Reliabel
Perceived Enjoyment	PE4	0.759	0.869	Valid & Reliabel
Perceived Enjoyment	PE5	0.768	0.869	Valid & Reliabel
Flow	FL1	0.720	0.817	Valid & Reliabel
Flow	FL2	0.680	0.817	Valid & Reliabel
Flow	FL3	0.724	0.817	Valid & Reliabel
Flow	FL4	0.770	0.817	Valid & Reliabel
Satisfaction With Experience	SWE1	0.791	0.859	Valid & Reliabel
Satisfaction With Experience	SWE2	0.744	0.859	Valid & Reliabel
Satisfaction With Experience	SWE3	0.744	0.859	Valid & Reliabel
Satisfaction With Experience	SWE4	0.742	0.859	Valid & Reliabel
Purchase Intention	PI1	0.784	0.820	Valid & Reliabel
Purchase Intention	PI2	0.764	0.820	Valid & Reliabel
Purchase Intention	PI3	0.787	0.820	Valid & Reliabel

3.3 Structural model fit test

The structural model fit test (Table 2) shows that all goodness-of-fit measures fall into the Good Fit category. Absolute fit measures are categorized as Good Fit if the Chi-Square/df value is ≤ 2 , GFI > 0.9 , RMSEA < 0.08 , and SRMR < 0.1 (Hu & Bentler, 1995). The test results show a Chi-Square/df of 1.660, a GFI of 0.912, a SRMR of 0.027, and an RMSEA of 0.037. The ECVI value (1.778) is also closer to the ECVI Saturated Model (2.075) than the ECVI Independence Model (21.014). In incremental fit measures, the NFI, RFI, IFI, NNFI (TLI), and CFI values were all ≥ 0.90 , thus confirming the structural model's suitability.

Table 2. Structural model fit test

Ukuran Goodness of Fit	Value	Information
Absolute Fit Measures		
Chi-Square/df	1.660	Good Fit
GFI	0.912	Good Fit
SRMR	0.0271	Good Fit
RMSEA	0.037	Good Fit
ECVI	1.778	-
ECVI for Saturated Model	2.075	Good Fit
ECVI for Independence Model	21.014	-
Incremental Fit Measures		
NFI	0.968	Good Fit
RFI	0.930	Good Fit
IFI	0.923	Good Fit
NNFI (TLI)	0.971	Good Fit
CFI	0.971	Good Fit

3.4 Causal relationship test and hypothesis testing

The results of the causal relationship test (Table 3) show two insignificant direct effects: Credibility → Satisfaction With Experience ($t = 1.588$; $p = 0.113$) and Flow → Satisfaction With Experience ($t = 0.219$; $p = 0.826$), while all other direct effects are significant. In the indirect effect, the relationship between VIPA → SP → CR → SWE ($t = 1.615$; $p = 0.107$) and VIPA → SP → FL → SWE ($t = 0.222$; $p = 0.824$) was also not significant, while VIPA → SP → SWE, VIPA → SP → PU → SWE, and VIPA → SP → PE → SWE showed positive and significant results.

Table 3. Path coefficient (direct dan indirect effect)

Path	Std. Regression Weight	S.E	<i>t-value</i>	<i>p-value</i>	<i>Sig.</i>
Direct Effect					
VIPA → SP	0.994	0.076	3.313	0.001	Yes
VIPA → PU	-0.710	-0.568	1.694	0.009	Yes
VIPA → CR	-2.113	-2.488	3.928	0.000	Yes
VIPA → PE	-3.230	-3.744	3.928	0.000	Yes
VIPA → FL	-2.863	-0.322	3.928	0.000	Yes
VIPA → SWE	-5.401	-5.861	3.109	0.002	Yes
SP → CR	3.056	1.774	3.928	0.000	Yes
SP → PU	1.687	0.682	3.928	0.000	Yes
SP → PE	4.157	2.460	3.928	0.000	Yes
SP → FL	3.834	2.157	3.928	0.000	Yes
SP → SWE	5.831	14.946	2.281	0.023	Yes
CR → SWE	1.281	1.113	1.588	0.113	No
PU → SWE	1.161	1.882	2.761	0.006	Yes
PE → SWE	-1.700	3.483	1.965	0.050	Yes
FL → SWE	-0.284	0.613	0.219	0.826	No
SWE → PI	1.004	0.057	3.313	0.001	Yes
Indirect Effect					
VIPA → SP → SWE	-	-	4.314	0.000	Yes
VIPA → SP → PU	-	-	2.822	0.005	Yes
→ SWE					
VIPA → SP → CR	-	-	1.615	0.107	No
→ SWE					
VIPA → SP → PE	-	-	2.001	0.046	Yes
→ SWE					
VIPA → SP → FL	-	-	0.222	0.824	No
→ SWE					

Table 4. Hypothesis test recapitulation

Hipotesis	Path	t-value	p-value	Result	Reference Journal Results
H1	VIPA → SWE	3.109	0.002	Support	Support
H2	VIPA → SP	3.313	0.001	Support	Support
H3	VIPA → PU	1.694	0.091	Support	No
H4	VIPA → CR	3.928	0.000	Support	Support
H5	VIPA → PE	3.928	0.000	Support	Support
H6	VIPA → FL	3.928	0.000	Support	No
H7	SP → PU	3.928	0.000	Support	Support
H8	SP → CR	3.928	0.000	Support	Support
H9	SP → PE	3.928	0.000	Support	Support
H10	SP → FL	3.928	0.000	Support	Support
H11	SP → SWE	2.281	0.023	Support	No
H12	PU → SWE	2.761	0.006	Support	Support
H13	CR → SWE	1.588	0.113	No	Support
H14	PE → SWE	1.965	0.050	Support	Support
H15	FL → SWE	0.219	0.826	No	No
H16	SWE → PI	3.313	0.001	Support	Support

H17	SP mediates VIPA → SWE	4.314	0.000	Support	No
H18	SP & PU mediates VIPA → SWE	2.822	0.005	Support	Support
H19	SP & CR mediates VIPA → SWE	1.615	0.107	No	Support
H20	SP & PE mediates VIPA → SWE	2.001	0.046	Support	Support
H21	SP & FL mediates VIPA → SWE	0.222	0.824	No	Support

3.5 Discussion

The test results show that Virtual Influencers' Perceived Anthropomorphism (VIPA) has a significant direct effect on Satisfaction with Experience (SWE), and SWE also has a significant effect on Purchase Intention (PI). Social Presence, Perceived Usefulness, and Perceived Enjoyment are proven to significantly mediate the effect of VIPA on SWE, as indicated by H1–H12, H14, H16, H17, H18, and H20, which were accepted. Unfortunately, the results of H17 in this finding contradict Kim & Park (2024), who stated that Social Presence does not significantly mediate the relationship between VIPA and SWE. However, this finding aligns with research by Hofeditz et al. (2022), Cheng et al. (2022), and Cobb (2011), which states that Social Presence represents the emotional component of virtual influencer anthropomorphism and plays a mediating role in consumer satisfaction with the experience. Thus, the higher Arbie Seo's social presence among Gen Z, the greater the influence of his anthropomorphism on satisfaction generated when viewing endorsement content on social media.

Meanwhile, H19 and H21 were not significant, thus rejecting the hypothesis. This finding also contradicts Kim & Park (2024), who stated that social presence, along with credibility and flow, mediates the effect of VIPA on SWE. However, the H19 finding aligns with Schouten et al. (2019), who explain that credibility can have varying impacts on consumers and does not always lead to satisfaction, especially if the virtual influencer's credibility is not accompanied by appropriate product-endorser fit. H21 shows that flow responses do not necessarily lead to consumer satisfaction because the response can simply be a sense of curiosity, rather than satisfaction from the experience itself.

H1 indicates that anthropomorphism significantly influences satisfaction with the experience of Arbie Seo's endorsement content. The H1 result contradicts the uncanny valley theory, which states that the higher the level of anthropomorphism of a virtual influencer, or the greater the degree of similarity of a virtual influencer to a real person, the more likely it is to trigger negative reactions, feelings of discomfort, and dissatisfaction. Furthermore, the H1 result in this study aligns with previous research (Kim & Park, 2023), where anthropomorphism in virtual influencers influences consumer experiences with Arbie Seo's endorsement content on social media. Therefore, anthropomorphism in virtual agents or virtual influencers is crucial for fostering customer satisfaction on social media.

The results of the study above indicate that H2 is consistent with previous research (Kim & Park, 2023), where virtual influencers with anthropomorphism significantly influence the social presence of Arbie Seo in society, especially in digital media. Furthermore, this hypothesis also supports Nass et al.'s (2000) assertion that anthropomorphism in virtual influencers is crucial for creating a social presence on social media. Based on the table above, H3 indicates that virtual influencers with perceived anthropomorphism significantly influence the perceived usefulness of Arbie Seo on social media. Unfortunately, this finding contradicts previous research (Kim & Park, 2023), which found that virtual influencers' perceived anthropomorphism did not significantly influence perceived usefulness on social media. This relates to the social presence created by virtual influencers, where perceived usefulness of virtual influencers is driven by their social presence in the digital sphere. Furthermore, the findings of H3 shows that

anthropomorphism in virtual influencers can influence respondents' perceived usefulness and is also an important factor in shaping consumer satisfaction.

The results of this study indicate that virtual influencers with anthropomorphism have an influence on establishing credibility in the digital media sphere. This suggests that the social attributes assigned to virtual influencers can build their credibility in the community. Edwards et al. (2016) also added that the more comprehensive the attributes and knowledge inputted into a virtual agent, the more credible the service will be. This study's results support previous research (Kim & Park, 2023), which found that virtual influencers with anthropomorphism significantly influence perceived enjoyment for consumers when viewing Arbie Seo's endorsement content on social media. This suggests that Arbie Seo's endorsement content will create enjoyment for consumers when Arbie Seo is given social attributes (anthropomorphism).

Anthropomorphism significantly influences Flow in Arbie Seo's endorsement content on social media. Unfortunately, this finding contradicts previous research (Kim & Park, 2023), which found that virtual influencer anthropomorphism did not significantly influence Flow in social media. This is related to social presence, which influences the creation of Flow in consumers regarding virtual influencer content on social media. Meanwhile, this finding is supported by the statement (Bressler & Bodzin, 2013) where when virtual influencers present something to the audience on social media, including providing social attributes (anthropomorphism), this can stimulate the psychological condition of consumers, entertain them or it can be said. The hypothesis analysis table above shows that social presence significantly influences perceived usefulness for Arbie Seo as a virtual influencer on social media. The results of H7 in this study support previous research (Kim & Park, 2023), which found that social presence significantly influences perceived usefulness for consumers when viewing Arbie Seo's endorsement content on social media. Arbie Seo's social presence demonstrates his ability to convey social messages in promotional activities that can benefit the audience or viewers of Arbie Seo's endorsement content. These results indicate that the hypothesis is accepted, as social presence significantly influences the credibility of Arbie Seo as a virtual influencer on social media. The results of H8 in this study support previous research (Kim & Park, 2023), which found that social presence significantly influences the credibility of virtual influencers in the eyes of the public, especially within the social media sphere. Furthermore, Melnychuk et al. (2024) also revealed that the social presence of virtual influencers can influence their credibility in attracting customers. This proves that establishing a strong social presence for virtual influencers will increase their credibility as influencers.

The H9 significant results indicate the acceptance of the hypothesis, which states that social presence significantly influences consumers' perceived enjoyment when watching Arbie Seo's content on social media. The H9 finding also aligns with previous research (Kim & Park, 2023), which found that virtual influencers' social presence significantly influenced consumers' perceived enjoyment. In the digital world, consumers' perceived enjoyment is closely related to an interactive approach (Hussain et al., 2020). This interactive approach involves the virtual influencer's social presence so that their presence can be felt by the audience.

The H10 results also indicate that the social presence hypothesis significantly supports the accepted hypothesis. This finding supports previous research (Kim & Park, 2023), which found that social presence significantly influences consumer flow when viewing endorsement content from virtual influencers, or in this study, Arbie Seo, on social media. The creation of flow is closely related to consumer behavior on social media. When consumers perceive the social presence of a virtual influencer, this contributes to flow, where they become immersed or drawn into watching Arbie Seo's content, resulting in a sense of enjoyment. Based on the research results table above, social presence significantly influences satisfaction with experience. Unfortunately, this finding contradicts previous research (Kim & Park, 2023), which found that social presence significantly influences satisfaction with experience. Meanwhile, the results of this study align with research, which states that a higher social presence from a virtual agent increases consumer satisfaction

with the experience. It can be concluded that increasing social presence among Gen Z will increase Gen Z's satisfaction that is formed when watching Arbie Seo's endorsement content on social media.

The H12 results indicate that perceived usefulness significantly influences satisfaction with consumers' experiences with Arbie Seo's endorsement content on social media. These findings support previous research (Kim & Park, 2023), which found that perceived usefulness significantly influences consumer satisfaction with experience when viewing virtual influencer content providing product information. This can create benefits for consumers and meet their expectations. In this study, respondents experienced satisfaction with the experience when they felt helpful with the product information explained or promoted by Arbie Seo, the virtual influencer. The H13 research table above shows that credibility did not significantly influence satisfaction with experience. This finding is supported by previous research (Schouten et al., 2019), which states that credibility can have varying impacts on consumers and does not necessarily lead to consumer satisfaction. Schouten et al. (2019) added that virtual influencer credibility without product-endorser fit can lead to anthropomorphism, and the established presence, even if credible, still fails to deliver customer satisfaction. Therefore, it can be concluded that credibility does not significantly influence Gen Z's satisfaction with experience when viewing Arbie Seo's endorsement content on social media.

The H16 results confirm the hypothesis that satisfaction with experience significantly influences Purchase Intention. The findings show that a positive customer experience with a technology service will drive purchase intention. This is in line with other research findings that indicate that satisfaction with experience is a key mediator that can drive consumer purchase intention. In this study, respondents indicated that their satisfaction with Arbie Seo's endorsement content on social media influenced their purchase intention for the promoted product. Based on the research results table above, the H17 results indicate that social presence mediates the effect of virtual influencers on satisfaction with experience. Unfortunately, this finding contradicts previous research (Kim & Park, 2023), which stated that social presence did not mediate the effect of virtual influencers on satisfaction with experience. Meanwhile, the results of this study align with research (Hofeditz et al., 2022; Cobb, 2022), which revealed that social presence represents the emotional component of virtual influencers' anthropomorphism and plays a mediating role in consumer satisfaction with the experience. Therefore, it can be concluded that increasing social presence among Gen Z will increase the influence of Arbie Seo's anthropomorphism on Gen Z's satisfaction when viewing Arbie Seo's endorsement content on social media.

The data analysis results above indicate that when consumers perceive endorsement content by virtual influencers as useful or beneficial to them, the social presence they create will be effective, creating a memorable experience. Furthermore, this hypothesis was also supported by Edwards et al. (2019) who emphasized that perceived usefulness is a key factor in the relationship between virtual agents' social presence and positive consumer impressions and experiences. The social presence and flow mediate the effect of virtual influencers' perceived anthropomorphism on satisfaction with experience, this finding contradicts the research results (Kim & Park, 2023) with the same hypothesis. However, this finding is supported by the research of Saad & Choura (2022), where in their research revealed that the response flow felt by consumers does not affect satisfaction with the experience because the response does not necessarily encourage consumers to pleasure, or may only feel the offer so that this does not encourage their satisfaction. Therefore, it can be concluded that satisfaction with experience cannot significantly mediate the effect of virtual influencers with anthropomorphism on satisfaction with experience of Gen Z when viewing Arbie Seo's endorsement content on social media.

4. Conclusions

This study shows that Virtual Influencer's Perceived Anthropomorphism significantly influences Satisfaction With Experience, and Satisfaction With Experience, in turn,

significantly influences Generation Z's Purchase Intention on social media. The higher the anthropomorphism or social attributes attached to the virtual influencer, the higher the customer satisfaction with Arbie Seo's content, which in turn increases purchase intention for the promoted product. Social Presence, Perceived Usefulness, and Perceived Enjoyment were shown to significantly mediate this influence, while Credibility and Flow did not significantly mediate the effect of VIPA on SWE.

This study has several limitations. The target respondents focused only on Generation Z, so the results only reflect the perspective of that group. The study also focused on only one virtual influencer, Arbie Seo, so the findings only reflect the perspective of his audience. Furthermore, this study did not directly display all of Arbie Seo's promotional content to respondents, so questionnaire responses depended on respondents' recall of previously viewed content.

For marketers, these results emphasize the importance of considering a virtual influencer's social presence and the fit with a brand's image before engaging them as an endorser, for example through interactive content like Q&As, daily activities, live broadcasts, or attendance at offline events. Perceived usefulness should also be considered through content that helps audiences make product choices. Given the dominance of TikTok and Instagram in influencing respondents' purchasing decisions, marketers are advised to maximize the use of virtual influencers on these two platforms. Future research is recommended to expand the scope of respondents to other generations, such as millennials and Generation X, and consider the subject of virtual influencers more generally to increase generalizability.

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Author Contributions

Conceptualization, D.A. and S.D.; Methodology, D.A.; Software, D.A.; Validation, D.A. and S.D.; Formal Analysis, D.A.; Investigation, D.A.; Resources, D.A.; Data Curation, D.A.; Writing – Original Draft Preparation, D.A.; Writing – Review and Editing, S.D. and L.A.K.S.; Visualization, D.A.; Supervision, S.D.; Project Administration, D.A.; Funding Acquisition, none. All authors have read and approved the submitted version of the manuscript.

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Ethical Review Board Statement

Formal ethical review and approval for this study were waived because the study used an anonymous online questionnaire, did not involve any risky interventions, and did not collect sensitive personal data from respondents.

Informed Consent Statement

Informed consent was obtained from all respondents involved in this study through a written consent statement at the beginning of the online questionnaire before completing the main questions.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request, given the privacy restrictions surrounding respondents' identities.

Conflict of Interest

The authors declare no conflicts of interest. The funders had no role in the study design; in the collection, analysis, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Declaration of Generative AI Use

Generative artificial intelligence (ChatGPT, Quillbot) was used solely for language editing and proofreading.

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