

Purchase intention to virtual influencer marketing: Social presence theory highlights authenticity over influencer type

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Abstract

Purchase intention endorsed by virtual influencers remains inconsistent across studies, leaving a practical gap in how exposure translates into buying. This study examines whether anthropomorphic appearance and behavior increase purchase intention via social presence and perceived authenticity, and whether influencer type matters. Guided by Social Presence Theory, we conducted a cross-sectional online survey; the hypothesized relationships were evaluated using SEM. Results show that anthropomorphic appearance and behavior significantly heighten social presence, social presence increases perceived authenticity, and perceived authenticity strongly predicts purchase intention. Conversely, influencer type shows no meaningful effect on authenticity and does not improve the indirect pathway from anthropomorphism to purchase intention. The findings recommend that practitioners prioritize human-like visual and behavioral cues and design interactions that cultivate social presence and authenticity rather than relying on celebrity status. Limitations include the cross-sectional design, use of a single virtual influencer stimulus, and a relatively homogeneous sample; future work should test multiple stimuli using longitudinal designs.

Keywords: Virtual Influencer Marketing, Anthropomorphism, Perceived Authenticity, Purchase Intention.

Abstrak

Niat pembelian terhadap produk yang didukung oleh virtual influencer telah ditemukan tidak konsisten di berbagai penelitian, sehingga menimbulkan kesenjangan praktis mengenai bagaimana paparan berpengaruh pada perilaku membeli. Penelitian ini menelaah apakah *anthropomorphic appearance* dan *anthropomorphic behavior* meningkatkan *purchase intention* melalui *social presence* dan *perceived authenticity*, serta apakah *influencer type* berperan dalam hubungan tersebut. Penelitian ini dilakukan melalui survei daring *cross-sectional*, dan hubungan yang dihipotesiskan dievaluasi menggunakan SEM. Hasil menunjukkan bahwa *anthropomorphic appearance* dan *anthropomorphic behavior* secara signifikan meningkatkan *social presence*, *social presence* meningkatkan *perceived authenticity*, dan *perceived authenticity* secara kuat memprediksi *purchase intention*. Sebaliknya, *influencer type* tidak memberikan pengaruh berarti terhadap *perceived authenticity* dan tidak memperkuat jalur tidak langsung dari antropomorfisme menuju *purchase intention*. Temuan ini menunjukkan bahwa isyarat visual dan perilaku yang menyerupai manusia lebih penting dibandingkan status selebritas dalam membentuk respons konsumen. Penelitian ini memiliki keterbatasan terkait desain potong lintang, penggunaan satu stimulus *virtual influencer*, dan karakteristik sampel yang relatif homogen.

Kata kunci: Virtual Influencer Marketing, Anthropomorphism, Social Presence And Perceived Authenticity, Purchase Intention.

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1. Introduction

Purchase intention refers to a consumer's conscious plan or stated likelihood to purchase a product or brand and is commonly used as a proximal indicator of buying behavior in marketing research (Ajzen, 1991; Spears & Singh, 2004). In influencer marketing, purchase intention is not only driven by product attributes but also by consumers' evaluations of the endorser and the marketing message, especially perceptions of credibility and authenticity that shape persuasion and trust (Audrezet et al., 2020; Ren et al., 2023).

Customers generally exhibit a variety of behaviors when making decisions about purchasing goods or services, and many of these behaviors are influenced by other people, particularly in digitally mediated environments where recommendations, reviews, and social cues are continuously visible (Sintia et al., 2023). In social commerce contexts, purchase intention may be strengthened when consumers perceive greater social support and informational value from others, because such cues help reduce uncertainty and perceived risk prior to purchase decisions (Sintia et al., 2023).

In parallel with the expansion of social media marketing practices, brands increasingly experiment with virtual influencers computer-generated personas that operate on social platforms and can be strategically designed and managed to engage audiences (Davlembayeva et al., 2025). Compared with human influencers, virtual influencers can offer managerial advantages such as fewer physical constraints and greater controllability over communication strategy, making them attractive for brand-controlled campaigns (Dabiran et al., 2024; Ozdemir et al., 2023). These features help explain why virtual influencer marketing has expanded and why marketers increasingly consider virtual endorsers as a viable communication channel.

At the same time, virtual influencers also introduce a unique persuasion challenge. Because they are digitally constructed, scripted, and do not possess real-world lived experiences, audiences may question their credibility and authenticity. Empirical findings are mixed, while some studies suggest virtual influencers can generate engagement and favorable brand outcomes, others indicate that they may be less persuasive than human influencers because audiences perceive them as lacking genuine experience and credibility (Lou et al., 2023; Ozdemir et al., 2023). Moreover, when virtual influencers appear "almost human," consumers may experience skepticism or discomfort that undermines favorable responses, reflecting an "almost human" penalty observed in research on virtual agents and social media presence (Arsenyan & Mirowska, 2021). These tensions suggest that virtual influencer effectiveness may depend on deeper psychological processes rather than mere exposure.

However, previous research on factors influencing purchase intention through virtual influencers remains inconsistent, with some studies finding significant positive effects while others report weak or non-significant relationships (Lou et al., 2023; Ozdemir et al., 2023). These inconsistencies create a theoretical and practical gap

regarding how exposure to virtual influencers translates into actual consumer intention to buy. Importantly, this pattern implies that the persuasion pathway is likely contingent upon how consumers interpret and psychologically “experience” the virtual influencer during interaction, rather than simply whether they see the endorsement.

One mechanism that has gained increasing attention in virtual influencer marketing is anthropomorphism, or the attribution of human-like qualities to non-human agents. In this context, anthropomorphism can be expressed through anthropomorphic appearance (e.g., human-like facial features, realistic body proportions, and expressive visuals) and anthropomorphic behavior (e.g., conversational tone, emotional expressiveness, interpersonal responsiveness, and “human” storytelling) (Ahn et al., 2022; Dabiran et al., 2024). Anthropomorphic cues can make interactions with digital entities feel more socially “real” and can strengthen perceived interpersonal connection with the virtual influencer, which may be a necessary step before consumers interpret the message as persuasive (Dabiran et al., 2024). At the same time, anthropomorphism is not automatically beneficial; the “right” balance of human-likeness and behavioral sociality may be required to avoid triggering skepticism or uncanny perceptions (Arsenyan & Mirowska, 2021; Lou et al., 2023).

From a theoretical perspective, social presence research suggests that technology-mediated communication can evoke a sense of the presence of another social actor, and this perception can strengthen relational judgments such as trust and warmth (Gefen & Straub, 2004). In CGI/virtual influencer contexts, perceived anthropomorphism has been empirically linked to stronger perceived social presence, which then shapes evaluations of sponsored posts and endorsed brands (Ahn et al., 2022). This is highly relevant to virtual influencer marketing because social presence can serve as a psychological bridge: when users feel as if they are interacting with a socially present entity, they may process messages in a more relational and trusting way.

In influencer contexts, stronger social presence may also foster perceptions that the communication is sincere and genuine, which is closely related to perceived authenticity. Authenticity is a central persuasion mechanism in influencer marketing because audiences are more likely to accept recommendations when they perceive influencer self-presentation and brand endorsements as sincere rather than purely commercial (Audrezet et al., 2020). Empirical evidence further indicates that perceived authenticity can directly enhance purchase intention and can explain differences in persuasive outcomes across influencer categories (Ren et al., 2023). For virtual influencers specifically, authenticity is repeatedly highlighted as a critical challenge for marketing effectiveness, motivating recent work to examine how design cues (including anthropomorphism) shape authenticity perceptions through social presence mechanisms and ultimately influence purchase intention (Yin et al., 2025).

However, important gaps remain. First, although anthropomorphic design is often discussed, research has only relatively recently begun to distinguish anthropomorphic appearance and anthropomorphic behavior as separate antecedents and to connect

them to downstream persuasion outcomes via social presence and perceived authenticity; consequently, the relative contribution of appearance versus behavior and the generalizability of the sequential pathway still warrant further empirical validation across contexts and audiences (Dabiran et al., 2024; Yin et al., 2025). Second, the role of influencer type (celebrity versus non-celebrity) remains theoretically debated: celebrity endorsers may benefit from higher perceived credibility and a professional image (Djafarova & Rushworth, 2017), while non-celebrity influencers can be viewed as more relatable and therefore more authentic (Schouten et al., 2020). In virtual influencer marketing, it remains underexplored whether anthropomorphic appearance can shape audiences' categorization of a virtual influencer as more "celebrity-like" versus more "non-celebrity-like," and whether this perceived influencer type subsequently influences perceived authenticity. In this sense, influencer type is not treated merely as a descriptive label but as a potential psychological mechanism through which visual cues guide inferences about status and public-figure-ness that may carry implications for authenticity judgments (Djafarova & Rushworth, 2017; Ren et al., 2023; Schouten et al., 2020).

Integrating these streams, this study develops a conceptual framework in which anthropomorphic appearance and anthropomorphic behavior operate as upstream design cues that shape consumers' psychological experience of the virtual influencer. Specifically, anthropomorphic appearance and anthropomorphic behavior are expected to strengthen perceived social presence; social presence is expected to increase perceived authenticity; and perceived authenticity is expected to translate into higher purchase intention (Audrezet et al., 2020; Gefen & Straub, 2004; Ren et al., 2023; Yin et al., 2025). In addition, the framework incorporates perceived influencer type (celebrity-like vs non-celebrity-like) as a mediating mechanism to evaluate whether anthropomorphic appearance shapes how audiences categorize the virtual influencer's type and whether such categorization subsequently influences perceived authenticity, thereby complementing the social-presence-based pathway toward persuasion outcomes (Djafarova & Rushworth, 2017; Ren et al., 2023; Schouten et al., 2020).

First, this research examines the extent to which anthropomorphic appearance and anthropomorphic behavior strengthen consumers' perceived social presence toward virtual influencers, reflecting whether audiences experience the virtual influencer as a socially present interaction partner rather than a purely artificial endorser (Ahn et al., 2022; Dabiran et al., 2024; Gefen & Straub, 2004). Second, the study tests a sequential psychological mechanism in which perceived social presence increases perceived authenticity, and perceived authenticity subsequently increases purchase intention. This sequential pathway is aligned with prior evidence that social presence supports relational judgments in mediated environments and that authenticity is a key determinant of persuasion and buying intentions in influencer contexts (Audrezet et al., 2020; Gefen & Straub, 2004; Ren et al., 2023; Yin et al., 2025).

Third, the study examines perceived influencer type (celebrity-like vs non-celebrity-like) as a mediating pathway linking anthropomorphic appearance to perceived

authenticity. This focus addresses whether audiences infer a “celebrity-like” versus “non-celebrity-like” status from visual anthropomorphic cues and whether that inference, in turn, shapes authenticity judgments, alongside the social-presence-based mechanism (Djafarova & Rushworth, 2017; Ren et al., 2023; Schouten et al., 2020).

Accordingly, the objectives of this research are to measure the effects of anthropomorphic appearance and anthropomorphic behavior on social presence, to examine the effects of social presence on perceived authenticity and the effect of perceived authenticity on purchase intention, and to test whether perceived influencer type (celebrity-like vs non-celebrity-like) functions as a mediating mechanism that predicts perceived authenticity within the proposed framework. These objectives are empirically examined using a quantitative survey and structural equation modeling to evaluate the hypothesized relationships among the study constructs.

2. Literature Review

Social Presence Theory in Virtual Influencer Marketing

This study is grounded in Social Presence Theory, which describes the degree to which people perceive human warmth, interpersonal closeness, and the feeling of “being with others” in technology-mediated communication. In other words, social presence explains why some mediated interactions feel cold and distant, while others feel personal and socially “real.” In digital marketing and e-commerce contexts, social presence is particularly important because it can reduce uncertainty and psychological distance, making online interactions feel more trustworthy and relational rather than purely transactional (Gefen & Straub, 2004).

In the context of virtual influencer marketing, social presence is essential because audiences evaluate not only the persuasive message, but also the perceived “social reality” of the endorser even when the endorser is computer-generated. When social presence is high, the virtual influencer can feel more “there,” more relatable, and more socially engaging, which can strengthen trust-related perceptions and support authenticity judgments in endorsement settings. This logic aligns with emerging evidence that human-like virtual influencers can shape consumer experience through social presence in social media endorsements (Kim & Park, 2024), while broader virtual influencer scholarship increasingly highlights authenticity and trust as central evaluation criteria (Audrezet et al., 2020; Khalfallah & Keller, 2025).

Anthropomorphism and Social Presence

Anthropomorphism refers to the tendency to attribute human characteristics, intentions, and mental states to non-human agents (Epley et al., 2007). In virtual influencer marketing, anthropomorphism is communicated through at least two core channels: (1) appearance and (2) behavior. Anthropomorphic appearance includes cues such as facial realism, human-like proportions, skin texture, and naturalistic styling. Anthropomorphic behavior includes cues such as emotionally expressive captions, conversational tone, responsiveness, and human-like interaction patterns (e.g., “daily life” storytelling, humor, empathy). Although many virtual influencers are explicitly artificial, these cues can still invite audiences to process them through

“human” schemas, increasing the likelihood of social responses and interpersonal interpretations (Dabiran et al., 2024).

Theoretically, anthropomorphic cues should enhance social presence because people respond socially to technologies once they display even minimal human-like signals (Nass et al., 1994). In virtual environments, higher anthropomorphism has been shown to increase perceived social presence and related constructs (Nowak & Biocca, 2003). Empirically, research in adjacent AI-agent contexts finds that anthropomorphism and interaction design can raise social presence (Munnukka et al., 2022). Importantly for virtual influencers specifically, (Ahn et al., 2022) report that perceived anthropomorphism increases social presence, which then improves downstream brand outcomes supporting the logic that anthropomorphism helps audiences experience a digital endorser as socially “present.”

Because appearance cues are often processed rapidly (first impressions) while behavioral cues accumulate through repeated exposure and interaction, both forms of anthropomorphism are expected to contribute to social presence in complementary ways. Appearance provides immediate human-likeness signals, while behavior sustains the illusion of interpersonal exchange over time especially on social media, where ongoing narrative and interactive communication shape perceived closeness. Therefore, stronger anthropomorphic appearance and behavior should both increase perceived social presence in virtual influencer endorsement settings (Kim & Park, 2024).

H1: Anthropomorphic Appearance has a positive effect on Social Presence.

H2: Anthropomorphic Behavior has a positive effect on Social Presence.

Social Presence and Perceived Authenticity

Perceived authenticity reflects the extent to which consumers view an influencer as genuine, honest, and trustworthy (Audrezet et al., 2020). In influencer marketing, authenticity is not simply “being real” in an objective sense; rather, it is a consumer judgment shaped by perceived sincerity, consistency, and credibility especially under commercial pressure where audiences may question persuasive intent. This challenge becomes even more salient with virtual influencers, whose artificial nature can trigger skepticism and ethical concerns (e.g., transparency, deception), yet can also produce a different standard of authenticity based on coherence of persona and perceived integrity of communication (Khalfallah & Keller, 2025).

Social presence can function as a psychological bridge that reduces perceived distance between consumers and virtual endorsers. When interactions with a virtual influencer feel socially “real,” audiences may be more likely to interpret communication as warm, intentional, and relational conditions that make authenticity judgments more favorable. This logic is consistent with evidence that social presence supports trust formation in online environments (Gefen & Straub, 2004). It is also aligned with emerging virtual influencer research proposing that social presence is a key mechanism linking anthropomorphic design to perceived authenticity and purchase-related outcomes (Yin et al., 2025). Therefore, when a virtual influencer is experienced

as socially present, consumers should be more inclined to evaluate the influencer as authentic.

H3: Social Presence has a positive effect on Perceived Authenticity.

Perceived Authenticity and Purchase Intention

Purchase intention refers to consumers' willingness to purchase a product after evaluating marketing communications and the credibility of the endorser. In influencer marketing, purchase intention is commonly used as a key outcome variable because influencer persuasion often operates through trust-related and relational cues rather than purely informational argument quality (Jin et al., 2019). Because influencer content frequently includes brand partnerships, authenticity becomes a critical persuasion cue: when audiences believe the influencer is sincere and credible, they are less likely to resist the message and more likely to accept recommendations as meaningful and trustworthy (Audrezet et al., 2020).

Empirical evidence consistently links authenticity-related evaluations to purchase intention. For example, (Ren et al., 2023) show that perceived authenticity is an important driver of consumers' purchase intention, although the strength of this effect can depend on contextual factors (e.g., influencer type and motivational orientation). Relatedly, research also suggests that authenticity often increases purchase intention through mechanisms such as perceived trustworthiness and inspirational impact (Andonopoulos et al., 2023). Taken together, the literature supports the expectation that higher perceived authenticity should directly increase consumers' intention to purchase products promoted by virtual influencers.

H4: Perceived Authenticity has a positive effect on Purchase Intention.

Influencer Type (Celebrity vs. Non-celebrity) and Authenticity

Influencer type (celebrity vs. non-celebrity) is frequently discussed as a factor shaping audience evaluations because it signals different forms of credibility and relational distance. Using influencers as a marketing tool can help brand managers announce new products or reposition existing products (Annisa & Yusran, 2022). Celebrity endorsers can be perceived as more credible due to fame, professional image, and strong public visibility, which may increase perceived legitimacy (Djafarova & Rushworth, 2017). Conversely, non-celebrity influencers (often aligned with micro-influencers) can be perceived as more relatable and closer to followers' everyday lives, which can strengthen identification and support authenticity perceptions (Schouten et al., 2020). In practice, audiences rely on observable cues to infer an influencer's category and status, and these inferences can influence downstream judgments such as credibility and authenticity.

In the context of virtual influencers, audiences may still categorize the influencer as "celebrity-like" or "non-celebrity-like" based on observable cues, including visual realism, styling, branding signals, and overall presentation. Recent work shows that consumers meaningfully differentiate among types of virtual influencers and form different relational outcomes depending on the influencer's presented (Yan et al.,

2024). Building on this categorization logic, a more human-like (anthropomorphic) appearance may function as a salient cue that pushes a virtual influencer closer to the mental schema of a “digital celebrity,” especially when the appearance aligns with polished, mainstream influencer aesthetics (Kim & Park, 2024). If audiences interpret the virtual influencer as more celebrity-like, they may grant greater legitimacy and credibility to the endorser, which can support authenticity judgments in endorsement contexts.

H5: Anthropomorphic Appearance has a positive effect on Influencer Type.

H6: Influencer Type has a positive effect on Perceived Authenticity.

The Mediating Role of Influencer Type

From an attribution perspective, people form social judgments by interpreting observable cues and then inferring underlying traits such as status, credibility, and intentionality (Heider, 1958). In digitally mediated contexts where direct interpersonal cues are limited users rely even more heavily on surface signals (e.g., appearance realism, presentation style, and professionalism) to categorize the source. Within influencer marketing, such categorization processes are important because perceived status (e.g., celebrity-like vs. non-celebrity-like) can shape whether audiences interpret the endorser as credible, distant, relatable, or authentic.

Applying this to virtual influencers, a more human-like appearance may increase the tendency to classify a virtual influencer as celebrity-like, which could influence authenticity perceptions. In other words, anthropomorphic appearance may not only affect authenticity directly (or through social presence), but may also operate indirectly by shaping the inferred influencer category that audiences use to evaluate legitimacy and sincerity (Schouten et al., 2020). Thus, influencer type is proposed as an intervening mechanism between anthropomorphic appearance and perceived authenticity.

H7: Influencer Type mediates the effect of Anthropomorphic Appearance on Perceived Authenticity.

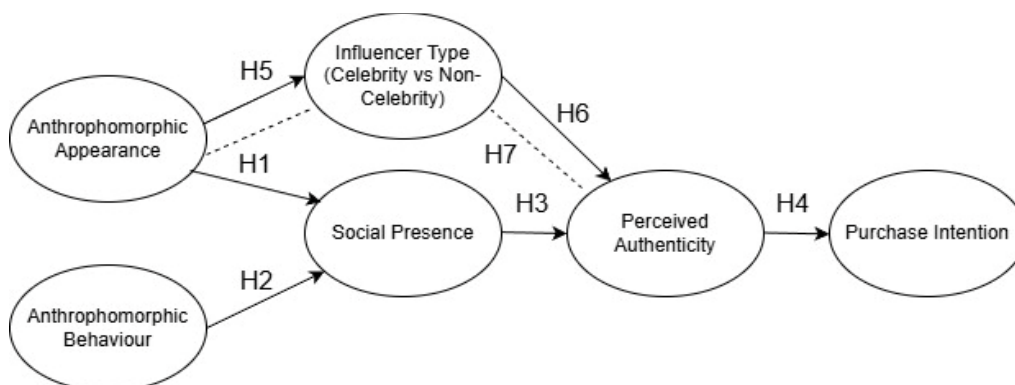


Figure 1. Conceptual Framework

3. Research Method

This study applies Structural Equation Modeling (SEM) estimated with AMOS as the main data analysis technique because the research purpose is confirmatory, namely

to test a previously formulated theoretical model and evaluate the overall suitability of the model to empirical data. SEM is appropriate for this study because it enables simultaneous testing of multiple relationships among latent constructs and mediation effects in a single model (Byrne, 2016; Hair et al., 2010).

This study employs a quantitative approach and an online survey, with Google Forms as the main instrument. The questionnaire was compiled based on adaptations from (Yin et al., 2025) research on virtual influencers in marketing and the (Ren et al., 2023) article on the influencer type variable, with language adjustments to make it easier for respondents in Indonesia to understand. Purposive sampling was used with the criterion that respondents were individuals who had seen or were familiar with the virtual influencer on Instagram. The questionnaire was distributed via Instagram, X, and WhatsApp for two weeks in October 2025. A total of 123 respondents participated in this study, and all answers were declared valid after screening for incomplete or inconsistent responses.

This study measures six latent constructs: Anthropomorphic Appearance, Anthropomorphic Behavior, Social Presence, Influencer Type, Perceived Authenticity, and Purchase Intention, all operationalized using multi-item scales rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Anthropomorphic Appearance is defined as respondents perceived human-likeness of a virtual influencer's visual presentation (e.g., realistic facial features, body proportions, and overall human-like look), while Anthropomorphic Behavior refers to the extent to which the virtual influencer is perceived to communicate and behave in human-like ways on Instagram (e.g., showing emotions, using natural language, and interacting in a person-like manner). These two constructs capture complementary forms of anthropomorphism visual and behavioral consistent with anthropomorphism theory that explains how people attribute human traits to non-human agents when they display human cues (Epley et al., 2007), and they were adapted to the virtual influencer setting based on prior work in this area (Yin et al., 2025).

Social Presence is operationalized as the degree to which respondents feel a sense of human warmth, interpersonal closeness, and social "realness" when viewing or engaging with the virtual influencer's content on Instagram, reflecting the extent to which the mediated interaction feels socially present rather than distant (Gefen & Straub, 2004). Influencer Type is operationalized as perceived celebrity-likeness (celebrity vs. non-celebrity orientation) in which higher scores indicate that respondents categorize the virtual influencer as more celebrity-like (e.g., high status, famous image, professional public persona), adapted from (Ren et al., 2023). Perceived Authenticity is operationalized as respondents' evaluation of the influencer as genuine, sincere, and trustworthy in delivering content and endorsements, aligned with authenticity conceptualization in influencer marketing research (Audrezet et al., 2020) and adapted to the virtual influencer context (Yin et al., 2025). Finally, Purchase Intention is operationalized as respondents' self-reported likelihood or willingness to consider, try, or purchase products promoted by the virtual influencer, consistent with

purchase intention as a core outcome variable in influencer marketing effectiveness studies (Jin et al., 2019).

To minimize the risk of standard method bias (CMB), this study implemented several preventive measures during data collection. First, the order of items between variables in the questionnaire was randomized so that respondents could not guess the relationship between questions and to reduce the tendency to answer consistently without considering the meaning of each statement. Second, the questionnaire instructions were written in a neutral, objective manner to prevent bias that could influence respondents' answers to the research variables. Third, this study ensured the anonymity of all respondents by not asking for personal identities, allowing respondents to provide honest answers free from social pressure or the desire to conform to certain norms. These steps were taken to ensure that the data obtained truly reflected the respondents' genuine perceptions and attitudes toward the phenomenon under study.

4. Results and Discussion

4.1. Results

The measurement model was evaluated to ensure that the indicators adequately represent their latent constructs. Item validity was assessed using item total Pearson correlations and significance values, while internal consistency reliability was assessed using Cronbach's alpha. The AMOS measurement output also indicated that all indicator loadings were statistically significant ($p < 0.001$). Overall, the constructs met the validity and reliability criteria. A summary is presented in Table 1.

To determine whether the hypothesized model adequately represents the observed data, goodness-of-fit was examined using multiple criteria. Given that the chi-square statistic is highly sensitive to sample size, model fit decisions were based on a set of complementary indices, including CMIN/DF, RMSEA, and incremental fit measures (CFI, TLI, and IFI). Table 2 reports the goodness-of-fit results for the default model.

Model fit was assessed using several goodness-of-fit indices covering absolute fit, incremental fit, and parsimonious fit (Table 2). The chi-square significance test did not meet the recommended criterion ($p = 0.000 < 0.05$), which suggests poor fit under this strict test; however, this outcome is common in SEM because chi-square is sensitive to sample size and model complexity. Therefore, the model was evaluated using multiple indices. The incremental fit indices indicate good fit, as shown by IFI = 0.932, TLI = 0.922, and CFI = 0.930 (all ≥ 0.90). In contrast, NFI (0.777) and RFI (0.748) fall below the recommended threshold, indicating that some incremental measures still show limitations. For parsimonious fit, the relative chi-square shows good fit (CMIN/DF = 1.339, within 1–5). Finally, RMSEA = 0.076 suggests a marginal-to-acceptable fit based on the applied criterion. Overall, although a few indices (p-value, NFI, and RFI) do not meet the cut-offs, the model demonstrates acceptable fit on key indices (CMIN/DF, IFI, TLI, and CFI), so it was considered adequate for hypothesis testing.

Table 1. Validity and Reliability Summary

Constructs	Items	Convergen	Cronbach's
		Validity	Alpha
		Pearson	Cronbach's
		Correlation	Alpha
Anthropomorphic appearance	This virtual influencer looks humanlike	0.658***	0.711
	This virtual influencer is lifelike	0.770***	
	This virtual influencer has humanlike appearance	0.786***	
	The physical characteristics of this virtual influencer resemble a real person	0.713***	
Anthropomorphic behavior	This virtual influencer has thoughts of its own	0.742***	0.825
	This virtual influencer has intentions	0.506***	
	This virtual influencer has free will	0.856***	
	This virtual influencer has consciousness	0.741***	
	This virtual influencer has desires	0.655***	
	This virtual influencer has values and norms	0.702***	
	This virtual influencer experiences emotions	0.684***	
Perceived authenticity	This virtual influencer is genuine	0.710***	0.635
	This virtual influencer is honest	0.772***	
	This virtual influencer is sincere	0.798***	
Social presence	Being exposed to this virtual influencer evokes a sense of human contact	0.746***	0.684
	Being exposed to this virtual influencer conveys a sense of human warmth	0.773***	
	Being exposed to this virtual influencer creates is a sense of human sensitivity	0.830***	
Purchase intention	I will buy the products that this virtual influencer advertised through social media platform	0.705***	0.789
	I have the intention to buy the products that this virtual influencer advertised through social media platform	0.787***	
	I am interested in buying the products that this virtual influencer advertised through social media platform	0.793***	
	It is likely that I will buy products that this virtual influencer advertised through social media platform in the future	0.848***	
Influencer type	I've seen this influencer before	0.765***	0.761
	I know this influencer very well	0.833***	
	I think this influencer is very famous	0.868***	

Note: *** signifi-nance at level 0.001

Table 2. Goodness-of-fit indices

Type of Measurement	Measure	Value	Recommended Acceptance Criteria	Conclusion
Absolute fit measures	<i>P</i>	0.000	≥ 0.05	Poorfit
	ECVI	7.424	Close to the saturated model and lower than the independence model	Goodness Of fit
	RMSEA	0.076	≤ 0.1	Marginal Fit
Incremental fit measures	IFI	0.932	≥ 0.90 or close to 1	Goodness of fit
	NFI	0.777	≥ 0.90 or close to 1	Poorfit
	TLI	0.922	≥ 0.90 or close to 1	Goodness of fit
	CFI	0.930	≥ 0.90 or close to 1	Goodness of fit
	RFI	0.748	≥ 0.90 or close to 1	Poorfit
Parsimonius fit measure	CMIN/DF	1.339	1 ≤ CMIN/ DF ≤ 5	Goodness of fit
	AIC	437.992	Close to the saturated model and lower than the independence model	Goodness of fit

The structural model was tested to evaluate the proposed hypotheses by examining both direct and indirect relationships among constructs. Direct effects were assessed using path coefficients and their significance (p-values). For mediation (indirect effects), significance was evaluated using the Sobel test, which examines whether the indirect pathway through the mediator is statistically different from zero. To present the findings systematically, the results of direct and indirect effects are reported together in a single table, including the hypothesis decision in Table 3.

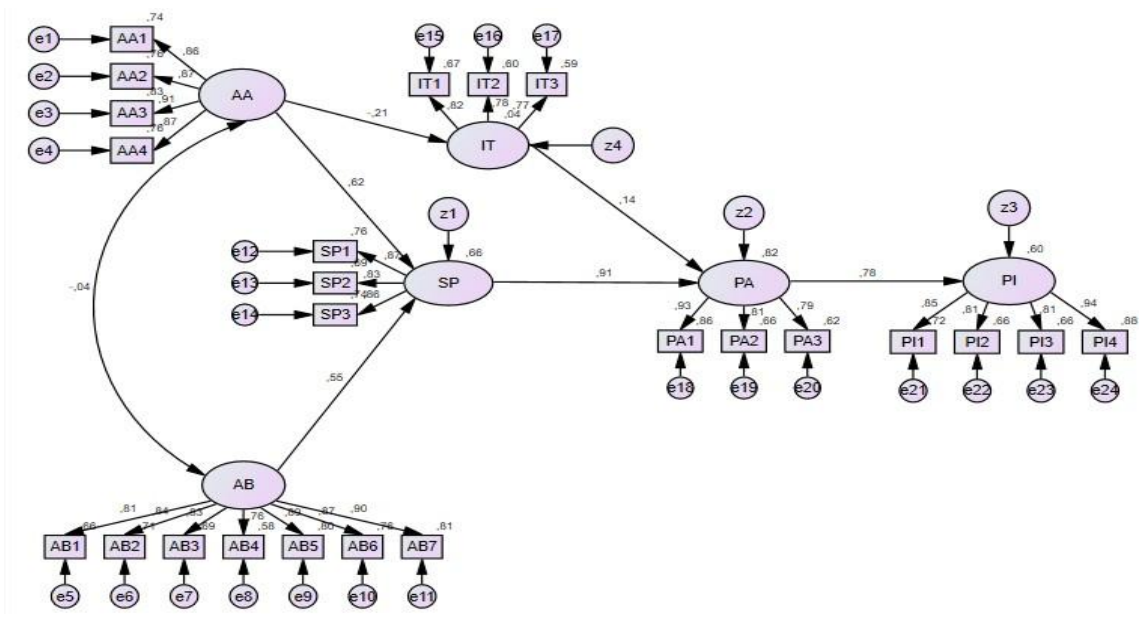


Figure 2. Structural Equation Model results.

Figure 2 shows the structural model with standardized estimates generated from AMOS. The diagram summarizes the magnitude and direction of the relationships among constructs, while Table 3 reports the statistical testing results for each hypothesis.

Table 3. Hypothesis Testing

Hypothesis	Relationship	Coefficient	P-value	Conclusion
H1	SP <--- AB	0,526	0,000	Supported
H2	SP <--- AA	0,610	0,000	Supported
H3	IT <--- AA	- 0,197	0,153	Not supported
H4	PA <--- SP	0,830	0,000	Supported
H5	PA <--- IT	0,135	0,110	Not supported
H6	PI <--- PA	0,924	0,000	Supported
H7	AA <-- IT <-- PA	0,533	0,288	Not Supported

Table 3 show that anthropomorphic behavior has a significant effect on social presence ($\beta = 0.526$; $p = 0.000$). This finding is consistent with the research of (Epley et al., 2007) and (Yin et al., 2025) which indicates that human-like behaviors, such as expressions, movements, and communication styles, can increase perceptions of social presence. Thus, the results of this study are consistent with previous findings that emphasize the importance of anthropomorphic behavior in creating interpersonal closeness in virtual influencers.

Anthropomorphic appearance was found to significantly influence social presence ($\beta = 0.610$; $p = 0.000$). These results align with the research (Dabiran et al., 2024) and (Yin et al., 2025) which found that the more human-like a virtual influencer's physical appearance is, the greater the audience's feelings of closeness and social presence. Thus, facial and body resemblance are important components in building social interactions that feel real.

The relationship between anthropomorphic appearance and influencer type is not significant ($\beta = -0.197$; $p = 0.153$). This finding differs from the research by (Djafarova & Rushworth, 2017), which states that visual resemblance can increase perceptions of celebrity, and from (Yan et al., 2024) which emphasizes that visual images can influence the classification of influencer status. The insignificant results may be due to the audience assessing influencer status not solely by appearance, but also by engagement, followers, or branding narratives, so that appearance alone is insufficient to determine influencer type.

Social presence significantly influences perceived authenticity ($\beta = 0.830$; $p = 0.000$). These results support the findings of (Kim & Park, 2024) dan (Audrezet et al., 2020) who found that greater sense of social presence is associated with higher perceptions of influencer authenticity. Interactions that are perceived as "present" make the audience see influencers as more authentic and human figures.

The influence of influencer type on perceived authenticity is not significant ($\beta = 0.135$; $p = 0.110$). This finding differs from (Djafarova & Rushworth, 2017), who found that celebrities are considered more credible. However, this study's results support some of (Schouten et al., 2020) findings, which stated that non-celebrity influencers are not always perceived as less authentic. This insignificance indicates that audiences assess the authenticity of virtual influencers not by celebrity status but by the quality of interaction and other anthropomorphic aspects.

The results show that perceived authenticity has a significant effect on purchase intention ($\beta = 0.924$; $p = 0.000$). This finding aligns with (Ren et al., 2023) who confirm that perceived authenticity is a strong predictor of purchase intention on digital platforms. When audiences perceive virtual influencers as authentic and trustworthy, they are more inclined to make purchases.

The Sobel Test results show that the indirect effect of anthropomorphic appearance on perceived authenticity through influencer type is not significant ($z = -1.062$; $p = 0.288$). This indicates that although an anthropomorphic appearance can influence how audiences assess influencer type (celebrity or non-celebrity), this mechanism is not strong enough to increase perceptions of authenticity.

This finding differs from that of (Djafarova & Rushworth, 2017) who found that celebrity status tends to increase the credibility and authenticity of public figures. Furthermore, these results also do not support the findings of (Yan et al., 2024) who stated that visual imagery can influence the audience's social perception and categorization of influencers. However, the results of this study are consistent with

those of (Schouten et al., 2020), who found that perceptions of authenticity are more influenced by the quality of interaction and social presence than by celebrity or non-celebrity status. Thus, in the context of virtual influencers, audiences do not use influencer type as a basis for assessing the authenticity of digital figures. Other factors, such as social presence, play a much more dominant role in shaping perceived authenticity.

4.2. Discussion

This study highlights that anthropomorphic cues are central in shaping consumers' psychological experience with virtual influencers, particularly by strengthening social presence and, subsequently, perceived authenticity, which then drives purchase intention. In other words, the findings suggest that the persuasive impact of virtual influencers is less about categorical status (celebrity-like vs non-celebrity-like) and more about how "socially real" and authentic the interaction feels.

First, the results indicate that both anthropomorphic appearance and anthropomorphic behavior significantly increase social presence. This pattern is consistent with prior research arguing that when digital entities look and behave more like humans, audiences tend to experience stronger interpersonal involvement in mediated environments (Dabiran et al., 2024; Epley et al., 2007; Yin et al., 2025). Thus, this study supports the notion that human-likeness works as an important cue that makes virtual influencers feel more present as a social actor, rather than merely a visual object on screen.

Building on this, the findings further show that social presence strongly enhances perceived authenticity. This result aligns with Social Presence Theory, which suggests that a higher sense of "being with another" reduces psychological distance and increases relational warmth, making communication more likely to be perceived as sincere (Gefen & Straub, 2004; Kim & Park, 2024). In line with (Audrezet et al., 2020), this implies that authenticity especially in influencer marketing is not only a trait attributed to the influencer, but also a consumer judgment that emerges from how interpersonal and convincing the interaction feels. Therefore, social presence appears to function as a key psychological bridge that transforms anthropomorphic cues into authenticity perceptions.

Next, the study confirms that perceived authenticity is a strong predictor of purchase intention, reinforcing prior findings that authenticity reduces skepticism toward endorsements and increases willingness to accept (Audrezet et al., 2020; Ren et al., 2023). This suggests that even in the case of virtual endorsers despite their artificial and scripted nature authenticity remains the most decisive factor for consumer response. Accordingly, the pathway in this study implies that purchase intention is strengthened when consumers first feel socially connected to the virtual influencer and then evaluate the influencer as genuine.

However, the results also reveal an important nuance: influencer type does not play a meaningful role in explaining authenticity within this model. Specifically, anthropomorphic appearance does not significantly shape influencer type, and

influencer type does not significantly affect perceived authenticity. This outcome contrasts with arguments that visually appealing figures are more easily perceived as celebrity-like and therefore more credible (Djafarova & Rushworth, 2017). Instead, the findings resonate more with (Schouten et al., 2020), who emphasize that authenticity judgments depend more on interaction quality and message fit than on celebrity status. In the virtual influencer context, this may indicate that audiences do not infer “status” primarily from appearance, and even when they do, such categorization is not sufficient to increase authenticity without supportive social experience (i.e., social presence).

Consistent with this pattern, the mediation test also indicates that influencer type does not serve as an indirect mechanism linking anthropomorphic appearance to perceived authenticity. This reinforces the broader interpretation that influencer type is not a central psychological bridge in the persuasion process for virtual influencers. Instead, the results suggest that the dominant mechanism remains the experiential route: anthropomorphic cues build social presence, social presence strengthens authenticity, and authenticity drives purchase intention.

Overall, this study contributes to virtual influencer marketing literature by showing that anthropomorphism and social presence form the core foundations shaping consumer evaluations, while influencer type categories contribute little in explaining authenticity in this setting. Practically, the findings imply that brands should focus on designing virtual influencers that feel socially engaging and authentic through both appearance and especially behavior rather than relying on celebrity-like positioning as the main strategy.

5. Conclusion

This study aims to analyze how anthropomorphic appearance and anthropomorphic behavior influence purchase intention through social presence, perceived authenticity, and influencer type in virtual influencers. The results show that anthropomorphic appearance and behavior significantly increase social presence, which, in turn, positively influences perceived authenticity. Perceived authenticity is an important determinant of purchase intention. However, influencer type does not have a significant effect on perceived authenticity and does not mediate the relationship between anthropomorphic appearance and perceived authenticity. These findings confirm that consumer experiences with virtual influencers are more influenced by the quality of anthropomorphism and perceptions of social presence than by influencer type categories.

Despite its theoretical and practical contributions, this study has several methodological limitations that need to be considered. The cross-sectional research design limits the ability to capture changes in consumer perceptions over time, so the relationships found are associative. In addition, this study uses virtual influencer stimuli with specific characteristics, so the generalizability of the findings to all types of virtual influencers should be approached with caution. The sample, which focused on specific social media users, may also introduce sampling bias, as users' preferences on other platforms may differ. Considering these limitations, future research should use a

longitudinal design, expand the range of virtual influencer stimuli, and involve a more heterogeneous sample to gain a more comprehensive understanding of the effectiveness of virtual influencers in digital marketing.

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References

- Ahn, R. J., Cho, S. Y., & Sunny Tsai, W. (2022). Demystifying Computer-Generated Imagery (CGI) Influencers: The Effect of Perceived Anthropomorphism and Social Presence on Brand Outcomes. *Journal of Interactive Advertising*, 22(3), 327–335. <https://doi.org/10.1080/15252019.2022.2111242>
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Andonopoulos, V., Jiyeon, J., & Mathies, C. (2023). Journal of Retailing and Consumer Services Authentic isn't always best: When inauthentic social media influencers induce positive consumer purchase intention through inspiration ☆. *Journal of Retailing and Consumer Services*, 75(July), 103521. <https://doi.org/10.1016/j.jretconser.2023.103521>
- Annisa, R. F. M., & Yusran, H. L. (2022). Pengaruh Beauty Influencer Terhadap Purchase Intention Melalui Brand Image. *Ijd-Demos*, 4(3), 954–962. <https://doi.org/10.37950/ijd.v4i3.285>
- Arsenyan, J., & Mirowska, A. (2021). Almost human? A comparative case study on the social media presence of virtual influencers. *International Journal of Human-Computer Studies*, 155, 102694. <https://doi.org/10.1016/j.ijhcs.2021.102694>
- Audrezet, A., de Kerviler, G., & Guidry Moulard, J. (2020). Authenticity under threat: When social media influencers need to go beyond self-presentation. *Journal of Business Research*, 117, 557–569. <https://doi.org/10.1016/j.jbusres.2018.07.008>
- Byrne, B. M. (2016). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. Routledge. <https://doi.org/10.4324/9781315757421>
- Dabiran, E., Farivar, S., Wang, F., & Grant, G. (2024). Virtually human: anthropomorphism in virtual influencer marketing. *Journal of Retailing and Consumer Services*, 79, 103797. <https://doi.org/10.1016/j.jretconser.2024.103797>
- Davlembayeva, D., Chari, S., & Papagiannidis, S. (2025). Virtual Influencers in Consumer Behaviour: A Social Influence Theory Perspective. *British Journal of Management*, 36(1), 202–222. <https://doi.org/10.1111/1467-8551.12839>

- Djafarova, E., & Rushworth, C. (2017). Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. *Computers in Human Behavior*, 68, 1–7. <https://doi.org/10.1016/j.chb.2016.11.009>
- Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, 114(4), 864–886. <https://doi.org/10.1037/0033-295X.114.4.864>
- Gefen, D., & Straub, D. W. (2004). Consumer trust in B2C e-Commerce and the importance of social presence: experiments in e-Products and e-Services. *Omega*, 32(6), 407–424. <https://doi.org/10.1016/j.omega.2004.01.006>
- Hair, J. F., Black, W. C., & Babin, B. J. (2010). *Multivariate Data Analysis: A Global Perspective*. Pearson Education, Inc.
- Heider, F. (1958). *The Psychology of Interpersonal Relations*. John Wiley & Sons, Inc. <https://doi.org/10.1037/10628-000>
- Jin, S. V., Muqaddam, A., & Ryu, E. (2019). Instafamous and social media influencer marketing. *Marketing Intelligence & Planning*, 37(5), 567–579. <https://doi.org/10.1108/MIP-09-2018-0375>
- Khalfallah, D., & Keller, V. (2025). Acta Psychologica Authenticity , ethics , and transparency in virtual influencer marketing : A cross-cultural analysis of consumer trust and engagement : A systematic literature review. *Acta Psychologica*, 260(July), 105573. <https://doi.org/10.1016/j.actpsy.2025.105573>
- Kim, H., & Park, M. (2024). When digital celebrity talks to you: How human-like virtual influencers satisfy consumer's experience through social presence on social media endorsements. *Journal of Retailing and Consumer Services*, 76, 103581. <https://doi.org/10.1016/j.jretconser.2023.103581>
- Lou, C., Kiew, S. T. J., Chen, T., Lee, T. Y. M., Ong, J. E. C., & Phua, Z. (2023). Authentically Fake? How Consumers Respond to the Influence of Virtual Influencers. *Journal of Advertising*, 52(4), 540–557. <https://doi.org/10.1080/00913367.2022.2149641>
- Munnukka, J., Talvitie-Lamberg, K., & Maity, D. (2022). Anthropomorphism and social presence in Human–Virtual service assistant interactions: The role of dialog length and attitudes. *Computers in Human Behavior*, 135, 107343. <https://doi.org/10.1016/j.chb.2022.107343>
- Nowak, K. L., & Biocca, F. (2003). The Effect of the Agency and Anthropomorphism on Users' Sense of Telepresence, Copresence, and Social Presence in Virtual Environments. *Presence: Teleoperators and Virtual Environments*, 12(5), 481–494. <https://doi.org/10.1162/105474603322761289>
- Ozdemir, O., Kolfal, B., Messinger, P. R., & Rizvi, S. (2023). Human or virtual: How influencer type shapes brand attitudes. *Computers in Human Behavior*, 145, 107771. <https://doi.org/10.1016/j.chb.2023.107771>
- Ren, L., Lee, S. K., & Chun, S. (2023). The effects of influencer type, regulatory focus, and perceived authenticity on consumers' purchase intention. *International Journal of Consumer Studies*, 47(4), 1241–1255. <https://doi.org/10.1111/ijcs.12898>
- Schouten, A. P., Janssen, L., & Verspaget, M. (2020). Celebrity vs. Influencer

- endorsements in advertising: the role of identification, credibility, and Product-Endorser fit. *International Journal of Advertising*, 39(2), 258–281. <https://doi.org/10.1080/02650487.2019.1634898>
- Sintia, L., Siagian, Y. M., & Kurniawati, K. (2023). The Determinants of Purchase Intention in Social Commerce. *Jurnal Manajemen Bisnis*, 14(1), 214–237. <https://doi.org/10.18196/mb.v14i1.15754>
- Spears, N., & Singh, S. N. (2004). Measuring Attitude toward the Brand and Purchase Intentions. *Journal of Current Issues & Research in Advertising*, 26(2), 53–66. <https://doi.org/10.1080/10641734.2004.10505164>
- Yan, J., Xia, S., Jiang, A., & Lin, Z. (2024). The effect of different types of virtual influencers on consumers' emotional attachment. *Journal of Business Research*, 177, 114646. <https://doi.org/10.1016/j.jbusres.2024.114646>
- Yin, G., Pei, Y., Farivar, S., Wang, F., & Wang, S. (2025). Virtual influencers in marketing: addressing authenticity challenges through anthropomorphism. *Asia Pacific Journal of Marketing and Logistics*. <https://doi.org/10.1108/APJML-01-2025-0025>