EXPLORING THE IMPACT OF ANTHROPOMORPHISM ON PARASOCIAL RELATIONSHIP WITH VIRTUAL INFLUENCERS: THE MEDIATING ROLE OF TRUSTWORTHINESS AND WISHFUL IDENTIFICATION

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Abstract

Research purpose:
This research explores how anthropomorphism influences the parasocial relationships that Generation Z in Ho Chi Minh City develop with virtual influencers, highlighting the mediating effects of trustworthiness and wishful identification.

Research motivation:
Although virtual influencers are experiencing rapid growth, academic research in this area remains limited compared to the extensive body of work on human influencers. Previous studies predominantly investigated individual mediating mechanisms in isolation. This study seeks to address this gap by simultaneously examining perceived trustworthiness and wishful identification, thereby providing a more comprehensive understanding of the psychological processes underlying consumer relationships with virtual influencers.

Research design, approach, and method:
A quantitative survey was conducted with Gen Z respondents who had prior exposure to virtual influencers. Data were collected via online and direct questionnaires and analyzed using Structural Equation Modeling (SEM) with SmartPLS and SPSS software.

Main findings:
The results show that anthropomorphic features of virtual influencers positively influence both trustworthiness and wishful identification. Both factors significantly mediate the relationship between anthropomorphism and parasocial relationships, with wishful identification exerting a stronger mediating effect than trustworthiness.

Practical implications:
Marketers should focus on designing virtual influencers that evoke wishful identification, as this more strongly shapes consumer relationships than trustworthiness. Campaigns should target the predominantly female Gen Z audience on platforms such as TikTok and Instagram, while ensuring a balance between personality and transparency to foster both emotional engagement and long-term brand loyalty.

Keywords: virtual influencers, anthropomorphism, parasocial relationships, trustworthiness, wishful identification.

List Of Abbreviations	
APP	Appearance
AVE	Average variance extracted
CR	Composite reliability

CogE	Cognitive experience
ConE	Conscious emotionality
MV	Moral virtue
PSR	Parasocial Relationship
SCT	Social Cognitive Theory
SMI	Social media influencer
TW	Trustworthiness
VIF	Variance Inflation Factor
VI	Virtual influencer
WI	Wishful Identification

1. INTRODUCTION

Marketing strategies in the digital era have undergone substantial transformation, increasingly leveraging technological tools to enhance consumer interaction and stimulate purchase intentions. However, the saturation of content on social media platforms such as Instagram poses significant challenges for brands seeking to capture and sustain consumer attention. In this environment, social media influencers (SMIs) have emerged as influential digital actors who curate lifestyle-oriented content, articulate personal perspectives, and collaborate with brands to disseminate sponsored messages (Böhndel, Jastorff, & Rudeloff, 2023).

The emergence of "virtual YouTubers" (Vtubers) can be traced back to 2016, when animated figures with lifelike visual attributes and behavioral dynamics began appearing in YouTube content and live-streaming formats (Miao et al., 2022; X. Zhou, 2020). The rise of virtual influencers (VIs) can be traced to early examples such as Lil Miquela in the United States around 2016 and Imma in Japan, both of which played pivotal roles in popularizing computer-generated influencers across different regions (Mei, 2021; Zourrig, Park, & Becheur, 2025). Projections indicate that the market for VIs may attain a value of $6.33 billion in 2024 and further expand to $8.3 billion in 2025 (Cao, Isa, Perumal, & Chen, 2025).

Beyond being AI-generated figures, VIs are also designed to operate in real time, enabling interaction with users in virtual settings (Sands, Ferraro, Demsar, & Chandler, 2022). They can possess human-like traits and personalities (Moustakas, Lamba, Mahmoud, & Ranganathan, 2020), with a clear personal identity and a large fan base on social media platforms (Thomas & Fowler, 2020). These virtual celebrities are gradually replacing traditional stars in brand communication strategies due to advantages such as lower costs and reduced reputational risks (Thomas & Fowler, 2020).

Firms are increasingly adopting VIs as innovative marketing tools, with some selecting well-known digital figures to serve as brand representatives (Franke, Groeppel-Klein, & Müller, 2023; H. Kim & Park, 2024; R. E. Lim & Lee, 2023). One prominent case is Lil Miquela (@lilmiquela), a computer-generated influencer, who has partnered with major brands including BMW. Yet, marketing campaigns supported by VIs are not consistently successful. For instance, when Ling endorsed Gucci lipstick, the endorsement did not create a significant impact on the target audience (Zhou, Li, Li, & Lei, 2024).

Therefore, academics have shown growing attention to examining the ways in which VIs shape consumer behavior (Belanche, Casaló, & Flavián, 2024). Although traditional SMIs have been widely studied, research on VIs remains limited when contrasted with their human counterparts (Ahn, Cho, & Sunny Tsai, 2022).

1.1. The Emergence and Application of Virtual Influencers

SMIs refer to individuals or entities who develop a strong online presence by consistently sharing engaging content, attracting a significant follower base (Djafarova & Trofimenko, 2018; Farivar, Wang, & Yuan, 2021). Given their extensive audiences, companies increasingly collaborate with influencers to market products and strengthen brand presence. This strategy offers several notable advantages for marketers, such as precise audience targeting, enhanced creativity in message delivery, stronger trust-building with followers, and improved control over marketing content (Hayran Şanlı & Ceylan, 2023; Sorooshian, 2025), and is now regarded as a fundamental pillar in modern business

marketing strategies.

Previous research on influencer marketing has largely focused on human influencers as key actors in the process (e.g., Cheung, Leung, Aw, & Koay, 2022; Leung, Gu, Li, Zhang, & Palmatier, 2022; Szakal et al., 2024). An increasing number of studies have highlighted multiple factors shaping the success of influencer marketing, including influencer-related attributes, psychological mechanisms on the follower side, and critical content characteristics (Johnstone & Lindh, 2022; Vrontis, Makrides, Christofi, & Thrassou, 2021). Scholars have outlined the underlying processes explaining how influencer marketing influences audiences, highlighting perceived credibility and the formation of parasocial interactions as central to building trust and engagement (Atta, Ahmad, Tabash, Varma, & Elsantil, 2025; Farivar et al., 2021; S. V. Jin & Ryu, 2020). Atta et al. (2025) highlight that credibility and trustworthiness attributed to vloggers can stimulate audience engagement with marketing content and positively shape their purchasing considerations. Grounded in these findings, the study analyzes how the anthropomorphism of VIs influences parasocial relationship (PSR) development, with trustworthiness (TW) and wishful identification (WI) acting as key mediating variables in the marketing context.

VIs constitute a new development within digital influencer practices and the wider landscape of marketing strategies. Notable examples include Lil Miquela, who was launched on Instagram in 2016 (Rabimov, 2020), and Shudu Gram, a computer-generated fashion model that first appeared in 2017, created by its developer. Unlike traditional animated marketing figures, VIs resemble the way social media personalities stand apart from classic celebrity endorsers. Traditional entertainers and animated icons usually achieve recognition through accomplishments or symbolic status, whereas VIs engage audiences by shaping identifiable characters and strategically managing their activity in digital media spaces (Schouten, Janssen, & Verspaget, 2019).

1.2. Anthropomorphism in online marketing

Anthropomorphism is understood as the tendency to assign human traits, motives, or emotions to entities that are not human, including animals, objects, or artificial agents (Epley, Waytz, & Cacioppo, 2007). Within VI marketing, anthropomorphism holds particular importance because it influences how audiences interpret and interact with AI-generated personas. Equipping VIs with human characteristics encourages individuals to regard them as socially approachable and emotionally engaging, which in turn supports the development of TW and WI. These mediating processes, in turn, facilitate the formation of PSRs, thereby increasing the effectiveness of VI-based marketing.

In effect, these mediating processes facilitate the development of parasocial interactions, enhancing the overall effectiveness of promotional activities led by VIs. Drawing from Golossenko, Pillai, & Aroean (2020) multidimensional framework of anthropomorphism in branding, this study emphasizes four interrelated facets that are particularly relevant for the design of VIs: appearance (APP), moral virtue (MV), cognitive experience (CogE), and conscious emotionality (ConE). APP captures how closely a VI mirrors human physical traits; elements such as facial symmetry, expressions, and gestures enhance perceived anthropomorphism and social presence, thereby increasing trust and identification among consumers (Nowak & Biocca, 2003). MV concerns the perceived morality and ethical stance of the VI, which shapes consumers' interpretation of the agent as a "good" or "bad" social actor and, in turn, influences perceived TW and responsibility (Aggarwal & Mcgill, 2012). CogE captures attributions of intelligence, awareness, and reasoning ability, resonating with the literature on mind perception (Gray, Gray, & Wegner, 2007), where digital agents endowed with cognitive capacity are often seen as more competent and persuasive communicators (Y. Kim & Sundar, 2012). Finally, ConE reflects the perceived ability of the VI to feel and express emotions in meaningful ways; emotional responsiveness fosters empathetic engagement and facilitates parasocial bonding between consumers and the influencer (Giles, 2002; Waytz, Cacioppo, & Epley, 2010). Together, these four facets establish a multidimensional understanding of anthropomorphism that underpins consumers' trust and identification with VIs.

1.3. Gaps identification and research objectives

Although earlier studies have explored the impact of anthropomorphic traits on VI perceptions, key gaps remain unaddressed. While studies have begun to explore mediating mechanisms, their scope remains narrow. Liu & Wang (2025) found that anthropomorphic cues such as humanness, attractiveness, and eeriness influence PSRs via TW and WI. Similarly, Wasti, Ellizabeth, Adhyatma, & Maulana (2024) emphasized that anthropomorphism interacts with authenticity and TW to shape consumer attitudes. J. S. Lim, Choe, Zhang, & Noh (2020) demonstrated that PSRs with streamers can be anticipated by levels of WI and emotional involvement, while Mehta, Shelat, & Bansal (2024) investigated how anthropomorphic features and self-congruence in VIs can enhance consumer engagement and perceived connection, highlighting the role of human-like traits in fostering stronger PSRs. Few studies have explored how TW and WI function as independent but complementary pathways, allowing an integrated view of human-like characteristics to reinforce PSRs with VIs. This combined framework, based on PSR Theory and Social Cognitive Theory (SCT), is essential for gaining a more detailed insight into the processes through which consumers develop strong bonds with non-human agents.

Crucially, while previous research has indicated that both cognitive (TW) and affective (WI) mechanisms may be active, the existing literature remains inconclusive regarding the specific nature of their mediating effects, particularly whether these mechanisms operate as full or partial mediators and the comparative strength of their respective influences.

Understanding which mechanism dominates the influence of anthropomorphism is vital for both theoretical refinement and practical strategy development.

To address these gaps, the present study pursues the following objectives:

RO1: To investigate how anthropomorphism influences TW and WI

RO2: To explore the influence of TW and WI on the formation of parasocial bonds with VIs.

RO3: To assess the nature of the mediating roles of TW and WI in the relationship between anthropomorphism and parasocial relationships.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Parasocial relationship

PSR describes an unreciprocated emotional connection that individuals develop with figures in the media, including celebrities, television characters, or influencers, where the audience feels closeness and familiarity despite the lack of two-way interaction (Horton & Richard Wohl, 1956). Within the realm of VIs, PSRs have gained importance, as audiences interact with these AI-generated characters in ways similar to real-life social connections. This trend is especially noticeable in digitally native Generation Z, as they place high importance on online engagement and authentic digital experiences.

Previous research indicates that PSR serves as a critical mechanism through which perceived human-like traits of media figures influence audience engagement. Stronger parasocial bonds are often associated with greater trust and identification with the influencer (Yuan & Lou, 2020). Specifically, for VIs, anthropomorphic features, consistent interaction patterns, human-like storytelling, and visually realistic personas contribute to strong parasocial connections, often comparable to those developed with traditional human influencers (D. Jin, Wan Abas, & Kamarudin, 2023; Omeish, Shaheen, Alharthi, & Alfaiza, 2025).

Moreover, when audiences perceive VIs as possessing cognitive awareness, emotional expressiveness, or moral values, these traits enhance TW and relatability, thereby deepening parasocial involvement (Dabiran, Farivar, Wang, & Grant, 2024; Mehta et al., 2024).

In this study, PSR theory serves as the conceptual framework for explaining how anthropomorphic traits in VIs, mediated by TW and WI, facilitate the formation of parasocial bonds. The emotionally and socially resonant personas of VIs encourage Gen Z users to attribute human-like traits, facilitating a sense of closeness and attachment that aligns with the proposed model.

2.2. Social cognitive theory

Originally introduced by Bandura (1986), SCT focuses on the reciprocal interaction among individual factors, environmental conditions, and behaviors in guiding human conduct. This triadic reciprocal determinism suggests that individuals' cognitive processes (e.g., attitudes, identification), their surrounding media environments, and their observable behaviors mutually reinforce each other. Given its explanatory power in media studies, SCT has been widely applied to understand how audiences interact with mediated figures such as influencers, streamers, and virtual characters (Bandura, 2001).

WI aligns with SCT's personal determinant. It reflects an internal, motivational–cognitive process in which individuals aspire to emulate or align with a media figure; evidence from live-streaming shows that WI operates as a personal driver that subsequently fosters relational outcomes with on-screen others (J. S. Lim et al., 2020). In our model, anthropomorphism is posited to activate this personal mechanism, consistent with SCT's view that media cues shape internal cognitions that, in turn, influence downstream outcomes.

TW is also located in SCT's personal domain because it is fundamentally a perceived, cognitive appraisal of a source's credibility. Decades of source-credibility research define TW as a perceived dimension (alongside expertise and attractiveness) measured via audience judgments (Ohanian, 1990). Contemporary credibility frameworks likewise model credibility assessment as a user cognition that people notice cues and interpret them to form credibility judgments (Fogg, 2003; Hilligoss & Rieh, 2008). Thus, in SCT terms, anthropomorphic cues function as environmental inputs that trigger personal cognitive evaluations (perceived TW).

By contrast, PSR is best situated on SCT's environmental side as a socially constructed relational state that emerges within symbolic media environments through repeated exposure and interaction with mediated personae (A. M. Rubin & Perse, 1987; Tukachinsky & Stever, 2019). Bandura's account of mass communication underscores that mediated systems constitute powerful symbolic environments that organize social ties and norms; PSR is one such emergent, environment-level outcome of ongoing audience–persona engagement.

In this study, SCT is applied to address the gap that prior research often examined anthropomorphism's effects in a linear

way (e.g., anthropomorphism → trust → PSR) or through a single mediating mechanism. SCT provides a more comprehensive lens by identifying WI and trustworthiness as two parallel psychological processes at the individual level that jointly foster PSRs at the environmental level. This perspective clarifies that anthropomorphism does not merely trigger a straightforward chain of effects but simultaneously activates multiple mechanisms that strengthen PSR with VIs.

2.3. Anthropomorphism and wishful identification

Anthropomorphism, defined as assigning human-like traits to non-human entities, is widely acknowledged as a key determinant of how individuals engage socially and emotionally with virtual agents (Epley et al., 2007; Mende, Scott, van Doorn, Grewal, & Shanks, 2019). Within the domain of VIs, anthropomorphism not only enhances perceptions of social presence but also facilitates the process of identification, as users are more likely to project human motives, emotions, and personalities onto these agents (S. Kim & McGill, 2011).

WI describes a cognitive process whereby individuals imagine themselves as similar to, or aim to emulate, a media figure's traits, behaviors, and lifestyle (Hoffner & Buchanan, 2005). Studies show that WI significantly contributes to the formation of parasocial bonds, fostering intimacy and respect toward media personas (Giles, 2002). In the case of VIs, anthropomorphic features, such as human-like APP, emotional expressions, and moral traits can enhance relatability and aspirational value, making followers more likely to identify with them on a wishful level (Appel, Grewal, Hadi, & Stephen, 2020).

Previous studies have demonstrated that anthropomorphic design elements in digital characters increase individuals' likelihood of perceiving similarity, relatability, and admiration (Nowak & Fox, 2018; Qiu & Benbasat, 2009). According to similarity-attraction theory, people tend to form bonds with others whom they see as similar to themselves (Byrne, 1971). By appearing more "human," VIs not only evoke social presence but also embody aspirational traits that audiences wish to emulate (Schramm & Hartmann, 2008).

Consequently, when VIs display pronounced anthropomorphic traits, individuals tend to engage in WI with them. This psychological mechanism provides a foundation for deeper PSRs in digital environments. Considering the above reasoning, the study proposes the following hypothesis:

H1: The anthropomorphism of VIs positively influences WI.

2.4. Anthropomorphism and trustworthiness

Anthropomorphism involves assigning human-like traits, behaviors, and cognitive abilities to non-human entities, including artificial intelligence systems or virtual agents (Golossenko et al., 2020; Mende et al., 2019). Within VI marketing, anthropomorphism generally appears across four dimensions: APP, MV, CogE, and ConE. Among these, APP plays a pivotal role in shaping users' psychological perceptions, particularly their sense of familiarity, social presence, and ultimately trust.

Prior research suggests that anthropomorphic cues enhance perceptions of credibility and social presence, which in turn increase TW evaluations (Lee, Peng, Jin, & Yan, 2006; Qiu & Benbasat, 2009). When VIs exhibit human-like attributes, audiences are more likely to perceive them as authentic social actors rather than artificial entities (Waytz et al., 2010). This perceived social realism fosters psychological closeness, reduces skepticism, and promotes higher levels of trust in mediated interactions (Gong, 2008). In digital marketing contexts, trust is especially crucial as it serves as a foundation for consumer engagement and relationship-building with non-human entities (Belanche, Casaló, Flavián, & Ibáñez-Sánchez, 2021).

Furthermore, anthropomorphic design elements, such as facial expressions, conversational abilities, and moral cues facilitate perceptions of warmth and competence, which are critical antecedents of trust (Fiske, Cuddy, & Glick, 2007; S. Kim & McGill, 2011). Thus, by embodying human-like traits, VIs can be perceived as more reliable, sincere, and socially capable. This aligns with the Computers Are Social Actors (CASA) paradigm, which posits that individuals instinctively apply human social scripts to anthropomorphic agents, thereby attributing them with qualities such as TW (Nass & Moon, 2000). Based on this theoretical and empirical foundation, the study proposes the hypothesis below:

H2: The anthropomorphism of VIs positively influences perceived TW.

2.5. The influence of wishful identification and trustworthiness on parasocial relationships

WI describes the tendency of an individual to aspire to resemble a media persona whom they admire or idealize, often imagining themselves in the influencer's position (Hoffner & Buchanan, 2005). This psychological process is particularly salient in parasocial contexts, where individuals form one-sided bonds with media figures based on repeated exposure and perceived similarity or aspiration.

When considering VIs, WI can be triggered by curated images and narratives that align with idealized lifestyles, especially in fashion and lifestyle content. When consumers see these aspirational traits embodied by a VI, they may not only admire them but also desire to be like them, leading to increased emotional investment and attention (Brown, 2015). This

cognitive-emotional involvement fosters the illusion of intimacy, which serves as a foundation for PSRs (Giles, 2002).

The mechanism underlying this influence involves the consumer projecting their ideal self onto the VI, thereby blurring the boundaries between admiration and imagined social interaction. As consumers continuously follow, engage, and idealize these VIs, their psychological connection deepens, simulating the emotional closeness typical of real-life friendships (Tian & Hoffner, 2010). This sustained engagement nurtures a stronger PSR, characterized by loyalty, emotional attachment, and trust. On the basis of this theoretical reasoning, the following hypothesis is formulated:

H3: WI with VIs positively influences consumers' PSR.

Perceived TW is a fundamental antecedent in the formation of social bonds, particularly in mediated environments where direct interpersonal cues are limited. In the case of VIs, who represent a hybrid of algorithmic design, human-like attributes, and commercial intent, trust functions as a psychological anchor that reduces uncertainty and increases consumers' willingness to engage. TW signals that the VI behaves in a consistent, reliable, and benevolent manner, even though it is not a sentient being. This perception is especially crucial in human–machine interactions, where relational cues must be inferred from design, communication style, and behavioral patterns (Weisman & Peña, 2021).

Beyond mitigating uncertainty, perceived TW also acts as a relational cue that fosters emotional closeness and ongoing engagement. Empirical evidence indicates that trust in media figures enhances the perceived authenticity of their communication and strengthens parasocial bonds (J. Kim & Song, 2016). Correspondingly, evidence from studies on SMIs suggests that the credibility and TW not only foster parasocial interaction but also influence subsequent consumer behaviors (Sokolova & Kefi, 2020). More recently, Kumar & Singh (2022) provided direct evidence that TW serves as a foundational driver of PSRs, underscoring its decisive role in shaping relational outcomes.

Collectively, research points to perceived TW as mediating the relationship between artificiality and perceived social presence, enabling consumers to suspend disbelief and relate to VIs in ways similar to real human counterparts. As PSRs rely heavily on perceptions of credibility and reliability, TW becomes a central mechanism that translates anthropomorphic cues into meaningful relational bonds. Based on this theoretical reasoning, the study formulates the following hypothesis:

H4: Perceived TW of VIs positively influences consumers' PSR.

2.6. The Mediating Role of Trustworthiness and Wishful Identification

Trustworthiness as a Mediator between Anthropomorphism and Parasocial Relationship

Prior research has consistently demonstrated that anthropomorphic features enhance the extent to which audiences perceive VIs as human-like and socially present (Ham, Li, Looi, & Eastin, 2024; Zhang, Mo, Sun, Zhou, & Ren, 2025). According to Parasocial Interaction Theory (Horton & Richard Wohl, 1956), PSRs are formed through an illusion of intimacy and simulated face-to-face interaction. Subsequent empirical evidence indicates that anthropomorphism functions as a facilitating mechanism by triggering social cognitive processing and activating human-related schemas, which in turn strengthens perceived credibility, particularly in terms of expertise and TW (Dabiran et al., 2024; Wenxi Weng, 2024).

Empirical research has demonstrated that VIs with anthropomorphic characteristics are perceived as more human-like and, consequently, as more trustworthy, which serves as a cognitive prerequisite for relational investment. Within Parasocial Interaction Theory, perceived trust serves as a foundational cognitive schema that facilitates emotional engagement. When audiences perceive a VI as highly trustworthy, their defensive skepticism is neutralized, allowing them to safely lower psychological resistance and allocate attentional and emotional resources to the interaction. This perception of competence and benevolence validates the relationship's feasibility, enabling audiences to actively consume the influencer's content and accept the illusion of reciprocity without the hindrance of rational doubt, thereby reinforcing both the intensity and persistence of PSR (Horton & Richard Wohl, 1956; R. B. Rubin & McHugh, 1987).

The formation of a PSR does not arise solely from the perception of human-like features but rather from the trust elicited through such humanization. In this process, TW functions as a cognitive filter that validates anthropomorphic cues and facilitates an affective readiness to engage in a relational bond. TW represents a cognitive pathway through which anthropomorphic cues enhance relational credibility. Accordingly, the following hypothesis is proposed:

H5: TW mediates the positive relationship between anthropomorphism and PSRs.

Wishful Identification as a Mediator between Anthropomorphism and Parasocial Relationship

VIs are frequently constructed as idealized personas that transcend the limitations commonly associated with human influencers. When these attributes are conveyed through anthropomorphic cues, audiences perceive them as both aspirational and relatable, which enhances their effectiveness as symbolic role models. This dynamic fosters WI, conceptualized as the audience's motivational inclination to emulate or become more like the media figure (Cohen, 2001).

When audiences aspire to emulate a VI, they develop a sustained motivational orientation that leads them to allocate

continuous and focused attention to the influencer's activities (Klimmt, Hartmann, & Schramm, 2006). This aspirational drive gradually transforms passive media exposure into active engagement characterized by heightened emotional investment. In this process, the PSR operates as a compensatory mechanism through which audiences symbolically move closer to their ideal self by affiliating with the VI. This process aligns with Social Cognitive Theory, wherein individuals learn and internalize desirable attributes from symbolic models through vicarious reinforcement (Bandura, 2001).

Such deepened emotional attachment serves as a critical indicator of a strong and enduring PSR, further reinforced by anthropomorphic design elements that render the VI simultaneously relatable and aspirational. This aspirational orientation functions as a motivational driver that compels audiences to invest the cognitive and emotional resources required to cultivate a deep, one-sided PSR. WI represents an affective – motivational pathway through which anthropomorphism stimulates aspirational connection. Accordingly, the following hypothesis is proposed:

H6: WI mediates the positive relationship between anthropomorphism and PSRs.

3. METHODOLOGY

3.1. Measures

This research utilized a pre-designed survey completed independently by respondents to measure the four focal constructs: anthropomorphism, TW, WI, and PSRs. The measurement items were derived and modified from existing research in influencer marketing and virtual interaction, ensuring both conceptual relevance and empirical robustness. The survey utilized a five-point Likert format, with options from 1 ("strongly disagree") to 5 ("strongly agree"), a method frequently employed to capture perceptual and attitudinal differences among participants given its proven reliability and ease of interpretation (Preston & Colman, 2000; Revilla, Saris, & Krosnick, 2014).

Anthropomorphism was conceptualized as a second-order reflective construct consisting of four first-order dimensions adapted from Golossenko et al. (2020). The first dimension, APP, was measured with three items, such as "These VIs have human-like APP in terms of their facial features and physical form." The second dimension, MV, was captured with three items reflecting perceived principles and morality, for example, "VIs are principled." The third dimension, CogE, was also measured with three items that assessed reasoning ability, such as "VIs are capable of reasoning." Finally, the dimension of ConE was measured with four items that captured the ability of VIs to experience and express emotions, exemplified by "VIs may feel compassion for people who feel depressed."

TW was measured with four items adapted from Yoon & Kim (2015), focusing on perceptions of honesty, sincerity, reliability, and dependability of the VI. WI was measured with four items adapted from Liu & Wang (2025), which captured the extent to which respondents aspired to resemble the influencer in behavior, communication style, or lifestyle. PSR was measured with five items, also adapted from Liu & Wang (2025), reflecting respondents' sense of intimacy, emotional closeness, and anticipation of ongoing interaction with the influencer.

To ensure clarity and cultural appropriateness, the original English items were translated into Vietnamese and then back-translated following Brislin's (1986) procedure. This process helped minimize semantic bias and maintain conceptual equivalence.

The robustness of content validity was ensured by consulting two academics with expertise in marketing and consumer research. Their evaluation focused on whether the items were conceptually sound, easy to interpret, and aligned with the cultural context of Vietnamese Gen Z consumers. Their feedback guided refinements to item wording and sequencing.

A small-scale pretest with 10 Gen Z respondents was conducted to check for potential ambiguities, response fatigue, and logical flow of the questionnaire. Minor revisions were made to improve readability. Following this, a pilot study with 480 respondents was carried out. All constructs achieved Cronbach's alpha levels greater than 0.70, the criterion proposed by Hair, Black, Babin, & Anderson (2010), indicating robust internal reliability of the scales for use in the primary survey.

3.2. Sampling and data collection

The study targets Generation Z, defined as those born between 1997 and 2010, with a particular emphasis on Ho Chi Minh City consumers who have previously engaged with VIs. This group was chosen because Gen Z represents a dynamic consumer segment with high digital engagement, making them appropriate for examining how anthropomorphism shapes PSRs.

According to the General Statistics Office of Vietnam (2019), Generation Z represented approximately 13.5% of the national population, with a notable concentration in Ho Chi Minh City, Vietnam's most populous urban center. This demographic concentration highlights the city as a suitable sampling frame for the study.

The sample size was determined using the rule of $n = m \times 10$ (Hair, Ringle, & Sarstedt, 2011), with 26 items, requiring a minimum of 260 responses. To account for invalid or incomplete data, an additional 10% was added, resulting in a target of approximately 286. In practice, 480 responses were collected, of which 456 valid cases remained after screening, meeting the minimum requirement and ensuring statistical power for PLS-SEM analysis.

A convenience sampling approach was used, with respondents reached through Messenger, Zalo, and Facebook and provided with a Google Forms link to complete the survey. The survey consisted of two main parts: (1) measures of anthropomorphism, TW, WI, and PSRs, and (2) demographic information such as age, gender. A screening question was applied to ensure that only respondents with prior experience engaging with VIs were retained for further analysis.

3.3. Analytical method

The present research follows a quantitative approach and utilizes Partial Least Squares Structural Equation Modeling (PLS-SEM) as the primary analytical technique to examine the hypothesized associations (Fornell & Larcker, 1981). Quantitative methods are characterized by the use of structured tools and techniques to gather and interpret numerical data, allowing researchers to uncover patterns, test relationships, and examine trends (Malhotra, Kim, & Agarwal, 2004; Xu, Dinev, Smith, & Hart, 2011).

The analytic procedure unfolded across two primary phases. In the initial stage, the authors analyzed the demographic data using SPSS version 26.0 to examine the specific aspects of the demographic framework. Subsequently, variables related to the constructs were cleaned and analyzed using SmartPLS.

The analytical process involved several key steps. In the first stage, the measurement model was examined by evaluating item outer loadings, alongside indicators of reliability such as Cronbach's alpha, composite reliability (CR), and the average variance extracted (AVE). Evidence of convergent validity was derived from the magnitude of indicator loadings, whereas discriminant validity was verified through the Heterotrait-Monotrait Ratio (HTMT) and Fornell-Larcker criterion. In addition, the study employed the Variance Inflation Factor (VIF) to examine potential multicollinearity issues within the model. To test the proposed model, a bootstrapping procedure with 5,000 resamples was performed, allowing the statistical significance of both direct and mediating effects to be rigorously assessed.

4. RESULTS AND DISCUSSION

4.1. Assessment of the Measurement Model

Demographic characteristics

A total of 480 survey responses were initially collected. After a rigorous screening process to remove invalid or incomplete entries, 456 valid responses were retained for the final data analysis.

Table 1. Characteristics of the respondents

Respondents (n=456)			
Characteristics		Number	Percentage
Gender	Male	116	25.4%
	Female	340	75.6%
Age	15 – 17	42	9.2%
	18 – 24	397	87.1%
	25 – 28	17	3.7%

Construct reliability and validity

The reliability and validity of the measurement model were evaluated using Cronbach's alpha, CR, AVE, and outer loadings.

Table 2. Construct validity and reliability

Variables and items	Cronbach's alpha	CR	AVE	Outer loadings
Appearance	0.862	0.914	0.780	
APP1				0.918
APP2				0.934
APP3				0.790
Cognitive experience	0.763	0.864	0.679	
CogE1				0.804

CogE2				0.823
CogE3				0.843
Conscious emotionality	0.861	0.906	0.706	
ConE1				0.859
ConE2				0.766
ConE3				0.867
ConE4				0.866
Moral virtue	0.871	0.921	0.795	
MV1				0.889
MV2				0.876
MV3				0.909
Anthropomorphism	0.884	0.904	0.440	
APP1				0.610
APP2				0.601
CogE1				0.661
CogE2				0.658
CogE3				0.670
ConE1				0.706
ConE2				0.623
ConE3				0.650
ConE4				0.742
MV1				0.742
MV2				0.628
MV3				0.655
Parasocial relationship	0.846	0.891	0.621	
PSR1				0.768
PSR2				0.752
PSR3				0.873
PSR4				0.794
PSR5				0.747
Trustworthiness	0.782	0.872	0.695	
TW1				0.848
TW2				0.806
TW4				0.846
Wishful identification	0.887	0.922	0.747	
WI1				0.809
WI2				0.897
WI3				0.896

WI4				0.852
Notes: APP (Appearance), MV (Moral virtue), CogE (Cognitive experience), ConE (Conscious emotionality), Anthro (Anthropomorphism), TW (Trustworthiness), WI (Wishful identification), PSR (Parasocial relationship)				

Table 2 reports the results of the reliability and validity assessment. The Cronbach's alpha coefficients for all constructs exceed the recommended threshold of 0.7, and the CR values are also above 0.7 (Hair et al., 2010), confirming the internal consistency of the measurement scales. The results of the confirmatory factor analysis indicate that all outer loadings are higher than 0.6, suggesting that the relationships between the indicators and their respective constructs are statistically significant. Furthermore, the AVE values for all constructs are greater than 0.5, with the exception of the second-order construct Anthropomorphism.

The slightly lower AVE value for the second-order construct Anthropomorphism (i.e., below 0.50) can be theoretically justified. This construct comprises four first-order dimensions (APP, MV, CogE, and ConE) so the limited number of indicators may inherently constrain the extracted variance. Moreover, the relatively low inter-correlations among these dimensions suggest that each represents a distinct conceptual facet of anthropomorphism. Such conceptual heterogeneity reduces the shared variance, thereby limiting the capacity of the second-order construct to explain a substantial proportion of the variance of its dimensions, which leads to an AVE value below 0.50. Nevertheless, all outer loadings of the first-order constructs exceed the acceptable threshold of 0.60, while the Composite Reliability (CR = 0.904) and Cronbach's alpha ($\alpha = 0.884$) are both higher than the recommended threshold of 0.70. These results align with the guidelines of Ho, Wu, Lee, & Pham (2020) and Lam (2012), who suggest that when AVE is slightly below 0.50 but CR exceeds 0.60, the construct may still demonstrate adequate convergent validity. Therefore, despite the marginally low AVE value, the reliability and validity of Anthropomorphism remain acceptable.

Descriptive Statistics And Correlation Analysis

Table 3 reports the descriptive statistics and Pearson correlation coefficients for all variables at the team level. Overall, all variables exhibit positive correlations with one another, providing preliminary empirical support for the proposed hypotheses.

Table 3. Descriptive statistics and correlation analysis

	Mean	SD	APP	MV	CogE	ConE	TW	WI	PSR
APP	3.763	0.969	1						
MV	3.337	1.018	0.331**	1					
CogE	3.575	0.946	0.319**	0.542**	1				
ConE	3.220	1.033	0.472**	0.359**	0.540**	1			
TW	3.500	0.969	0.508**	0.632**	0.509**	0.353**	1		
WI	2.974	1.211	0.451**	0.516**	0.605**	0.556**	0.655**	1	
PSR	3.129	0.994	0.528**	0.584**	0.565**	0.562**	0.638**	0.758**	1
Note: **. Correlation is significant at the 0.01 level (2-tailed).									

Discriminant Validity

Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT) (Table 4) and the Fornell–Larcker criterion (Table 5), following the recommendations of Hair, Hult, Ringle, & Sarstedt (2017) and Henseler, Ringle, & Sarstedt (2015). As reported in Table 4, all HTMT values fall below the threshold of 0.90, ranging from 0.278 to 0.881, indicating that discriminant validity is established. Moreover, Table 5 shows that all bold diagonal elements, representing the square roots of the AVE values, are greater than the corresponding inter-construct correlation coefficients, thereby fulfilling the Fornell–Larcker criterion (Fornell & Larcker, 1981; Hair, Hult, Ringle, & Sarstedt, 2017).

Table 4. Heterotrait - monotrait ratio (HTMT)

	APP	CogE	ConE	MV	PSR	TW	WI
APP							
CogE	0.373						
ConE	0.488	0.666					
MV	0.347	0.670	0.438				

PSR	0.571	0.696	0.608	0.679			
TW	0.533	0.658	0.443	0.767	0.779		
WI	0.440	0.736	0.616	0.591	0.876	0.785	

Table 5. Fornell-Larcker criterion

	APP	CogE	ConE	MV	PSR	TW	WI
APP	**0.883**						
CogE	0.613	**0.824**					
ConE	0.443	0.540	**0.840**				
MV	0.317	0.553	0.371	**0.891**			
PSR	0.508	0.555	0.569	0.584	**0.788**		
TW	0.477	0.510	0.356	0.674	0.647	**0.834**	
WI	0.414	0.611	0.558	0.765	0.765	0.658	**0.864**

Multicollinearity Assessment

To assess potential multicollinearity issues, both outer and inner VIF values were examined and are reported in Tables 6 and 7.

Table 6. Outer model

	VIF		VIF		VIF
APP1	2.614	ConE4	3.052	TW1	1.635
APP2	3.018	MV1	2.129	TW2	1.636
APP3	1.807	MV2	2.729	TW4	1.605
CogE1	1.814	MV3	2.745	WI1	1.850
CogE2	1.572	PSR1	2.003	WI2	3.095
CogE3	1.661	PSR2	1.859	WI3	2.873
ConE1	2.615	PSR3	3.073	WI4	2.216
ConE2	1.654	PSR4	2.295		
ConE3	2.931	PSR5	1.787		

Table 7. Inner model

	Anthropomorphism	PSR	TW	WI
APP	1.288			
CogE	1.772			
ConE	1.607			
MV	1.493			
Anthropomorphism			1.000	1.000
TW		1.763		
WI		1.763		

All outer VIF values were below the recommended threshold of 3.3, indicating the absence of multicollinearity among the measurement indicators. Likewise, the inner VIF values of the predictor constructs were also lower than 3.3, confirming that multicollinearity is not a concern in the structural model (Hair et al., 2017).

4.2. Hypothesis Testing and Structural Model Analysis

Hypothesis Testing

The empirical results presented in Table 8 demonstrate the standardized path coefficients and the significance levels among the variables within the model, providing a more intuitive representation of the relationships between them.

H1 proposes that the anthropomorphism of VIs positively influences WI. From the results in the table, it can be seen that Anthropomorphism (B = 0.712, p < 0.001) have a significant positive impact on consumers' WI, thus supporting H1.

H2 proposes that the anthropomorphism of VIs positively influences perceived TW. The interaction term between TW and anthropomorphism was significantly positive (B = 0.655, p < 0.001), showing that consumers will perceive VIs as more trustworthy if the VI has more anthropomorphism. Therefore, H2 is supported.

H3 proposes that WI with VIs positively influences consumers' PSR. As the results from the table below show, WI (B = 0.598, p < 0.001) significantly promotes consumer's PSR.

H4 proposes that perceived TW of VIs positively influences consumers' PSR. The interaction term between TW and PSR (B = 0.254, p < 0.001) was positive, indicating that the more TW customers have in VI, the more closely and intimately customers feel connected to the VI.

Table 8. Empirical analysis results

Path	β
Anthro → TW	0.655***
Anthro → WI	0.712***
TW → PSR	0.254***
WI → PSR	0.598***
Note(s): N = 456; *p < 0.05; **p < 0.01; ***p < 0.001	

Testing of Mediation Effects

As presented in Table 9, anthropomorphism exhibits significant indirect effects on PSR via WI (β = 0.425, p < 0.001) and TW (β = 0.166, p < 0.001), thus supporting H5 and H6. Combined with the significant direct effects shown in Table 8, these findings confirm a partial mediation mechanism. Notably, WI shows a stronger mediating impact, implying that cognitive engagement plays a more dominant role than affective trust in shaping PSR.

Table 9. Specific Indirect Effects

Indirect path	β
Anthro → WI → PSR	0.425***
Anthro → TW → PSR	0.166***
Note(s): N = 456; *p < 0.05; **p < 0.01; ***p < 0.001	

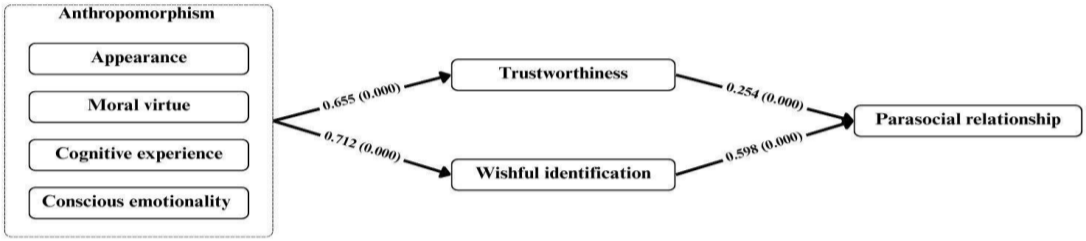


Fig. 1. Results of model testing

4.3. Discussion

This study examines the influence of anthropomorphism on PSR with VIs, with a focus on the mediating roles of TW and WI among Gen Z individuals aged 15 to 28. Grounded in identified research gaps and informed by two theoretical frameworks, PSR and SCT, the proposed model comprises four core constructs: anthropomorphism, TW, WI, and PSR Based on survey data and empirical analysis, the research team derived several key insights.

The results provide strong support for H1, indicating that anthropomorphism exerts a substantial positive effect on WI, representing the strongest path coefficient in the model ($\beta = 0.712$, $p < 0.001$). This outcome highlights the pivotal role of human-like attributes in fostering aspirational connections with VIs. This finding is fundamentally underpinned by the Social Attribution Mechanism and framed within Social Cognitive Theory (SCT). This strong association can be interpreted through the lens of SCT, wherein VIs operate as idealized self-models. The mechanism is initiated when the four dimensions of anthropomorphism - APP, MV, CogE, and ConE - prompt users to engage in internal attribution. The integration of higher-order anthropomorphic dimensions, such as MV and ConE, offers Gen Z users a salient psychological framework through which to project their aspirational identities. These attributes signify social and moral competence, leading users to attribute high levels of TW and desirability to the VI. This attribution process subsequently elicits emotional resonance and ideal-self congruence, reinforcing users' affective bond and motivation to emulate the VI. According to SCT, the resultant WI is the user's cognitive and affective desire to emulate the observed internal qualities, as the VI models a highly successful and ethically consistent version of the self. Thus, the Social Attribution Mechanism acts as a critical cognitive gateway, translating observed human-like cues into a motivationally potent internal template for self-improvement and aspiration.

H2 is strongly supported, indicating that anthropomorphism exerts a significant positive effect on perceived TW ($\beta = 0.655$, $p < 0.001$). This outcome is consistent with prior findings suggesting that human-like cues reduce initial skepticism toward VIs. The magnitude of this effect can be theoretically explained through the Social Attribution mechanism. While the foundational mechanism posits that human-like cues reduce skepticism, the high magnitude of the effect suggests that users move beyond mere familiarity toward dispositional attribution of desirable character traits. The inclusion of Moral Virtue and Conscious Emotionality in the anthropomorphic construct is pivotal, as these are the precise higher-order psychological dimensions that prompt users to attribute intrinsic benevolence and integrity. Specifically, the perceived Moral Virtue of the Virtual Influencer (VI) encourages the user to apply the fundamental Attribution Theory (Heider, 1958), interpreting virtuous actions as stemming from a stable, internal disposition (a "good" character) rather than extrinsic programming. This cognitive shortcut – a modified form of the Fundamental Attribution Error – is crucial because it elevates the VI from a mere digital artifact to a morally aware social entity, thereby drastically enhancing perceived social presence. Similarly, displaying Conscious Emotionality facilitates the attribution of shared mental states, fostering empathic connection and reducing the psychological distance between the user and the VI. When users attribute these internal, human-like qualities, the VI's perceived authenticity is strengthened, directly reinforcing the key components of trustworthiness: ability, benevolence, and integrity (Mayer, Davis, & Schoorman, 1995). Therefore, the substantial observed effect is not simply a function of human appearance, but a consequence of the Social Attribution Mechanism systematically transforming complex psychological cues into a robust belief in the VI's reliable and well-intentioned nature.

Both WI ($\beta = 0.598$, $p < 0.001$) and TW ($\beta = 0.254$, $p < 0.001$) exhibit significant positive effects on PSRs, confirming that both affective and cognitive mechanisms contribute to audience attachment toward VIs. Notably, the coefficient for WI → PSR ($\beta = 0.598$) is almost twice that of TW → PSR ($\beta = 0.254$), indicating that for Vietnamese Gen Z consumers, aspirational and affective resonance exerts a stronger influence than cognitive trust. This is consistent with SCT (Bandura, 1986) and Liu & Wang (2025), which conceptualize WI as a motivational pathway through which individuals internalize and emulate the desirable attributes of a model to reinforce social connectedness. Within the Vietnamese cultural context, characterized by collectivist orientation and socially driven value systems (Tran et al., 2022) audiences tend to form emotional attachments more readily than engaging in rational evaluation. VIs, as idealized and flawless representations of the "ideal self" (Le & Pham, 2024). facilitate this process by enabling users to momentarily suspend skepticism about authenticity and shift from cognitive appraisal ("Is this VI real and credible?") to affective aspiration ("I want to be like this VI"). Accordingly, engagement with VIs functions as a form of identity construction and symbolic learning, positioning WI as a more decisive determinant of enduring PSRs.

The mediation analysis confirms a partial mediation mechanism, indicating that Anthropomorphism exerts an indirect influence on PSRs through both TW ($\beta = 0.166$, $p < 0.001$) and WI ($\beta = 0.425$, $p < 0.001$). WI demonstrates a substantially stronger mediating effect ($\beta = 0.425$) compared to TW ($\beta \approx 0.166$). This constitutes a key contribution, as it suggests that emotional aspiration (WI) plays a more dominant role than rational appraisal (TW) in shaping PSRs. This pattern aligns with the notion that consumers acknowledge the virtual nature of VIs and subsequently engage in a suspension of rational skepticism. As a result, the focus shifts away from the ontological status of the VI (real or artificial) toward its symbolic value as an aspirational figure. Accordingly, the indirect path via WI functions as the primary psychological bridge, translating anthropomorphic cues into deep emotional and relational attachment. The stronger indirect effect of WI indicates that emotional and aspirational alignment is more decisive than cognitive trust in forming PSRs. This pattern

confirms partial mediation, where Anthropomorphism influences PSRs both indirectly through psychological mechanisms and directly through a residual effect.

Beyond the explanatory scope of PSR and SCT, the findings can also be interpreted through the lens of Dual Process Theory (Chaiken, 1980; Kahneman, 2011), which provides a complementary perspective on the underlying cognitive–emotional mechanism. At the pre-reflective level, anthropomorphic cues immediately activate system 1 processing (Kahneman, 2011), which involves an automatic and affective response that produces a sense of familiarity, warmth, and social presence. This intuitive resonance allows audiences to experience the VI as socially approachable even before any deliberate evaluation occurs. At the initial stage, anthropomorphic cues trigger a cognitive gatekeeping mechanism, whereby perceived TW functions as a prerequisite for emotional engagement. This phase corresponds to a system 2 (cognitive) route in Dual Process Theory (Chaiken, 1980; Kahneman, 2011), in which audiences rationally appraise whether the VI possesses benevolence, consistency, and integrity (Mayer et al., 1995). Importantly, TW in this context does not imply belief in the VI's ontological "realness" but rather confidence in its moral and intentional coherence—attributes often attributed to the developers or the character's designed persona. This cognitive reassurance reduces initial skepticism and legitimizes the VI as a socially acceptable interaction partner.

Once this cognitive threshold is met, the affective acceleration mechanism, led by WI, is unleashed and becomes the dominant force. WI represents a hybrid mechanism in which automatic affective responses (System 1) are sustained and rationalized through cognitive self-modeling processes (System 2). WI represents the core motivational mechanism of SCT (H1), where the VI, as a flawless, aspirational embodiment of the "Ideal Self," powerfully triggers processes of social learning and identity construction. The substantially larger coefficient for WI compared to TW confirms that for Gen Z users, the psychological focus shifts from rational evaluation ("Is this VI credible?") to affective aspiration ("I want to be like this VI"). The VI's intrinsic perfection facilitates this immediate emotional resonance, positioning WI as the primary driver that translates anthropomorphic cues into deep, enduring emotional attachment (Giles, 2002). Thus, the analytical insight of the dual-process model is clear: TW opens the door by managing skepticism, while WI fuels and determines the depth of the resulting PSR. This hierarchical interaction between the cognitive and emotional pathways constitutes the critical mechanism explaining the observed patterns.

5. CONCLUSION AND IMPLICATIONS

The conclusion section revisits the research objectives and demonstrates how each was addressed through the empirical findings. In this research, a comprehensive conceptual model encompassing Anthropomorphism - TW/WI - PSR was rigorously developed and empirically validated, effectively addressing all ROs. The findings provided robust evidence detailing the underlying psychological process.

Firstly, regarding RO1 (To investigate how anthropomorphism influences TW and WI), the Structural Equation Modeling (SEM) analysis demonstrated that the Anthropomorphism of VIs exerts a positive and significant impact on both TW ($\beta = 0.655$, $p < 0.001$) and WI ($\beta = 0.712$, $p < 0.001$). The findings substantiated that anthropomorphism serves as a critical antecedent, exerting a significant positive influence on both consumers' perceived TW and WI toward VIs. This underscores the fundamental role of human-like attributes in shaping consumer cognition and emotion, while highlighting that anthropomorphism is particularly effective in eliciting personal aspirations and ideal self-congruity (WI).

Secondly, in fulfilling RO2 (To explore the influence of TW and WI on the formation of parasocial bonds with VIs), the study confirmed that both mediating factors are statistically significant and positive antecedents of PSRs. Specifically, WI ($\beta = 0.598$, $p < 0.001$) exhibited a substantially stronger influence on PSRs compared to TW ($\beta = 0.254$, $p < 0.001$). This suggests that for Vietnamese Generation Z, affective resonance and life ideals (Identification) are more determinant than cognitive belief (TW) when forming an emotional bond with a non-physical entity like a VI.

Finally, in assessing RO3 (To assess the nature of the mediating roles), the research confirmed that both TW (indirect effect = 0.166) and WI (indirect effect = 0.425) function as partial mediators in the Anthropomorphism-PSRs relationship. Critically, the mediating role of WI was found to be significantly more dominant. This result is a key contribution of the study, providing empirical evidence for a dual psychological pathway, where WI serves as the primary channel translating anthropomorphic attributes into a deep-seated emotional attachment to the VIs. The study makes substantial theoretical and practical contributions by reinforcing and extending SCT and PSR, furnishing empirical validation of the multidimensional effects of anthropomorphism on consumers' parasocial engagement, and offering valuable insights for marketers in developing more strategically grounded approaches to VI marketing.

Theoretical Implications

This study provides three major theoretical contributions to the literature. First, it addresses the call of Sokolova & Kefi (2020) and advances the understanding of anthropomorphism's effect on trust by demonstrating that multidimensional anthropomorphism significantly enhances consumers' perceived TW ($\beta = 0.655$). Notably, this research adds nuance by showing that the construct's effectiveness arises from the inclusion of complex behavioral dimensions, namely MV, CogE, and ConE, alongside APP-based cues. By extending beyond mere physical APP, the findings indicate that these behavioral signals, which have been largely overlooked in prior studies, substantially reinforce the social attribution

mechanism (Konya-Baumbach, Biller, & von Janda, 2023). Consequently, consumers are able to infer the VI's benevolence and integrity, which constitute the core dimensions of trust (Mayer et al., 1995). Collectively, these insights emphasize the importance of capturing the full spectrum of human-like attributes, beginning with APP while highlighting behavior, when evaluating trust in synthetic entities.

Second, our findings provide novel empirical evidence that, in the context of Gen Z engagement with VIs, the affective pathway predominates in PSR formation. Mediation analysis indicates that the indirect effect via WI ($\beta = 0.598$) is nearly twice as strong as that of the cognitive pathway via TW ($\beta = 0.254$). This contributes to the PSR literature by demonstrating that emotional aspiration and identity construction are more decisive than rational trust assessment in shaping consumer - VI relationships. The results suggest a shift in relational dynamics from cognitive appraisal to affective aspiration, particularly when the modeled figure (VI) is perceived as an idealized, flawless entity. This finding is critical for understanding the affective nature of marketing - consumer bonds in the digital era.

Finally, this study contributes to SCT and cross-cultural research by clarifying the observed preference between the two mediating pathways. Based on the predominance of WI in a collectivistic context such as Vietnam, the findings provide a basis for conceptualizing cultural orientation as a potential moderating factor. We propose that collectivistic environments may predispose consumers toward affective pathways (WI), driven by aspirational self-comparison and symbolic learning, whereas models in individualistic contexts may be more aligned with rational pathways (TW), driven by utilitarian trust. This theoretical extension directs future research toward structured cross-cultural comparisons.

Practical Implications

Based on the findings of this study, several implications emerge for marketers, content creators, and businesses employing VIs in marketing campaigns. First, the results indicate that WI ($\beta = 0.598$) exerts a stronger influence on PSRs than TW ($\beta = 0.254$). Accordingly, brands should prioritize constructing aspirational narratives for their VIs, ensuring that they embody the values, lifestyles, and achievements that Gen Z consumers seek to emulate, rather than focusing solely on cultivating a trustworthy image. From a brand strategy perspective, virtual influencers should be deliberately designed as symbolic carriers of consumers' idealized identity goals. This process involves strategically aligning the virtual influencer's persona with aspirational themes such as authenticity, creativity, empowerment, or sustainability that resonate with the core values and ideal self-conceptions of the target audience. Visual design, tone of voice, and storytelling should all consistently reflect these aspirational cues to activate emotional engagement and identity alignment.

Second, TW plays a secondary yet essential role, it functions as the cognitive gateway that legitimizes emotional attachment. Therefore, brands should establish transparent design frameworks for their virtual influencers by disclosing information such as the creative team, methods of AI generation, and ethical data practices to enhance perceived integrity and reduce audience skepticism. Incorporating moral and consistent behavior into the narratives of virtual influencers, for example by avoiding controversial endorsements and demonstrating empathy, can further reinforce trust and enable WI to develop more deeply.

Third, from a design perspective, marketers should adopt a dual-layered persona strategy. The outer layer should appeal to system 1 processing by eliciting immediate affective resonance through visually engaging, expressive, and human-like features, while the inner layer should engage system 2 cognition by maintaining coherent backstories, moral consistency, and brand alignment. This integration of emotional and cognitive processing ensures both intuitive connection and rational credibility, thereby strengthening long-term relational bonding.

Finally, the demographic findings, particularly the predominance of Gen Z female participants (75.6%), suggest that initial go-to-market strategies should prioritize this segment on social media platforms, as females tend to value emotional connections and aspirational role models. However, these demographic insights should be considered in relation to the VI's identity. Future VI development should incorporate adaptive identity design, allowing the VI's persona to dynamically evolve based on audience feedback and data analytics, which ensures sustained relevance across diverse subcultures and gender groups. Such a tailored approach ensures that the VI's persona effectively leverages emotional aspirations to foster PSRs, rather than relying on a uniform, one-size-fits-all strategy.

6. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations that warrant consideration in future research. All variables were measured using self-reported surveys administered to the same participants at a single point in time, which may introduce common method bias and potentially inflate the observed relationships among variables. Although statistical procedures were employed to assess the validity of the proposed model, future studies should utilize multi-source data or experimental designs to further examine the robustness of the relationships identified.

In addition, this study focuses exclusively on Gen Z, who are digital natives, highly educated, creative, innovative, and technology-savvy (Priporas, Stylos, & Fotiadis, 2017), making it plausible that they have prior exposure to and engagement with VIs. However, reliance on a single generational cohort may limit the broader applicability of the findings. Business customer segments encompass individuals from multiple generational groups, and restricting the

investigation to Gen Z potentially reduces external validity and the generalizability of the results. Future research is encouraged to examine how anthropomorphism influences PSRs across more diverse age groups, thereby providing deeper practical insights.

Furthermore, future research should examine the moderating role of cultural context in the PSR mechanism. Although numerous prior studies have been conducted in individualistic Western settings, they rarely provide a theoretical explanation for preferences between alternative mediating pathways. Building on the observed predominance of WI in collectivistic cultures such as Vietnam, subsequent studies are encouraged to undertake formal cross-cultural comparisons. Specifically, future research should investigate whether models developed in individualistic contexts elicit a stronger preference for TW. Such investigations would help formalize the role of cultural orientation as a moderating factor, clarifying when emotional motivations (typically observed in Eastern cultures) versus rational motivations (typically observed in Western cultures) prevail in shaping the PSR mechanism. In doing so, future studies would not merely replicate prior work but also extend and enrich the theoretical understanding of PSRs.

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