

The Influence Mechanism of Virtual Influencers on Destination Brand Attachment: An Analysis Based on the Elaboration Likelihood Model (ELM)

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Abstract: This study aims to evaluate, through central and peripheral paths, how Virtual influencers (VIs) affect users' brand attachment towards destinations. Based on the Elaboration Likelihood Model (ELM), this research analyses how the attributes of Virtual Influencers (VIs), such as personalisation and anthropomorphism, influence users' brand trust and perceived enjoyment, which in turn impact brand attachment. The analysis is based on 388 valid questionnaire responses using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results indicate that the information quality and interaction quality provided by VIs significantly enhance users' brand trust, while personalisation and anthropomorphism boost perceived enjoyment, thus facilitating the formation of brand attachment. Furthermore, the studies confirm the moderating effect of brand self-congruity in the link between brand attachment and trust. Based on the findings, the study also offers recommendations for Destination Marketing Organizations (DMOs), suggesting that DMOs should emphasize the development of personalization and anthropomorphic characteristics in virtual influencer (VI) marketing to increase user brand loyalty.

Keywords: *Virtual Influencer, Destination Brand Attachment, Elaboration Likelihood Model (ELM), Destination Brand Self-Congruence.*

1. Introduction and Background

The tourism marketing sector has been significantly impacted by the rapid advancement of artificial intelligence (AI) technologies in recent years. Against this backdrop, a noteworthy phenomenon is the rise of virtual influencers (Vis) (Bulchand-Gidumal et al., 2024; Gaur et al., 2021; Sharma et al., 2022). VIs are digital characters created through AI technology and computer-generated imagery (CGI), garnering significant attention on social media platforms (Yu et al., 2024). In the tourism sector, VIs have emerged as brand ambassadors, helping to shape destination brands, attract substantial attention to tourist destinations, and foster brand loyalty (Choi et al., 2024).

In China's social media area, VIs have emerged as a new cultural phenomenon and are gradually permeating various fields, including the marketing of tourist destinations (Luo & Kim, 2023). Many well-known tourist destinations and cities have begun creating and operating their exclusive VIs to promote their unique features effectively (Conti et al., 2022; Meng et al., 2025). For instance, "Tianyu" serves as the virtual ambassador for the renowned tourist destination of the Mogao Caves in Dunhuang, Gansu Province, with her image design closely integrated with the cultural essence of the Mogao Caves (Yuan & Anuar, 2024).

Therefore, as "ambassadors" for tourist destinations, VIs not only help to shape a more appealing brand image but also enhance tourists' engagement and loyalty, which is conducive to forming positive brand attachments (Kim & Park, 2023; Na et al., 2023). In the research field related to VI marketing, scholars have primarily focused on analysing the influence of VIs, attempting to quantify their performance on social media, including follower counts, engagement rates, and content quality (De Brito Silva et al., 2022; Melnychuk et al., 2024; Stein et al., 2022). Additionally, user acceptance and perception are other important areas of study, with a focus on how VIs, as Key Opinion Leaders (KOLs) on social media, impact tourists' cognition and thereby promote awareness and preference for tourist destinations (De Cicco et al., 2024; Liu & Lee, 2024).

However, there are some gaps in these studies. On one hand, most current research is limited to descriptive analysis and lacks a systematic theoretical framework to comprehensively explain the mechanisms by which VIs endorse the image of tourist destinations (Meng et al., 2025; Xie-Carson et al., 2023). On the other hand, existing research often overlooks the differences in cognitive processing that audiences exhibit when handling

information conveyed by VIs (Park et al., 2024). Different audiences may process information through different paths depending on their psychological states, leading to varying attitude changes (Farivar et al., 2023). Furthermore, how to delve deeper into the psychological mechanisms behind VI endorsements and how these mechanisms affect brand attachment to destination brands is an issue that is often neglected in research (Zhou et al., 2024).

The study examined how VIs influence the degree of brand attachment to tourist destinations from both central route and peripheral route viewpoints, considering the research gaps based on the ELM. Employing PLS-SEM aims to address the current research's lack of a comprehensive theoretical framework, providing a more holistic model that reveals the specific psychological mechanisms through which VI endorsements enhance brand attachment to tourist destinations. Additionally, the study examined the moderating role of Destination Brand Self-Congruence in this process. The study aims to enhance the research community's understanding of the psychological mechanisms underlying virtual influencer (VI) endorsements for tourist destinations, thereby providing strategic guidance for Destination Marketing Organizations. The insights are expected to strengthen destination brand influence, enhance visitor experiences, and promote the adoption and innovation of VIs within the tourism marketing industry.

2. Literature Review

A VI is a digital character created through Computer-Generated Imagery (CGI) and AI technologies, primarily interacting with audiences via social media platforms, and has gradually become a new form of digital marketing tool (Allal-Chérif et al., 2024; Sookkaew & Saephoo, 2021; Yu et al., 2024). Compared to traditional influencers, VIs possess a high degree of malleability and controllability. Not only can their image designs be tailored to meet specific brand requirements, but their behaviours can also be optimised through algorithms and 3D modelling, thereby enhancing marketing effectiveness (Laszkiewicz & Kalinska-Kula, 2023). In recent years, academic research on VIs in the field of digital marketing has been increasing, with many studies focusing on the recognition of their identities and the credibility of the information they generate (Lou et al., 2024). Research indicates that, although VIs are not real individuals, their image design and behavioural patterns can win the trust of audiences through highly anthropomorphic expressions (Arsenyan & Mirowska, 2021; Lee et al., 2024). Researchers have explored various influencing factors, such as the visual realism of the VI, the authenticity of the information, and the interactivity with followers (Lou et al., 2023; Yu et al., 2024). Additionally, research has also examined whether brands establish a VI identity that aligns with user expectations when using VIs for brand promotion (Arsenyan & Mirowska, 2021; Koles et al., 2024).

About the emotional and cognitive dimensions of virtual influencers (VIs), research suggests that they not only attract audiences visually but also influence their emotional experiences and cognitive responses through multi-level emotional interactions and content presentation (Ham et al., 2024; Lim & Lee, 2023). Scholars have also explored how VIs enhance the interactivity between brands and audiences, thereby increasing the cognitive and emotional value of the brand and improving marketing effectiveness (De Cicco et al., 2024; Ozdemir et al., 2023). Specifically, the personification of the brand and the formation of brand attachment play crucial roles in this process (De Brito Silva et al., 2022; H. Kim & Park, 2023).

Although academic studies on VIs have advanced, some research gaps still need to be addressed. Much of the current literature on virtual influencers (VIs) tends to emphasise consumers' initial perceptions, while giving relatively limited attention to the longer-term implications of these perceptions. Moreover, how VIs contribute to brand attachment and loyalty, especially through distinct psychological processes, remains underexplored and calls for further empirical investigation.

The ELM, proposed by Petty and Cacioppo in the 1980s, serves as a dual-process model for explaining the persuasion process ("The Elaboration Likelihood Model of Persuasion," 1986). The core idea of the ELM is that when people receive persuasive messages, there are two distinct cognitive routes: the central route and the peripheral route (Andrews & Shimp, 1990). Through the central route, the persuasive message undergoes cognitive processing, and the audience evaluates the message based on its quality and relevance. In contrast, through the peripheral route, the audience relies more on external cues, such as attractiveness or simple emotional responses, to make judgments with less cognitive processing (Petty & Cacioppo, 2012).

In the field of tourism marketing, studies employ the ELM model to examine how consumers process information related to tourist destinations. When consumers choose a tourist destination, they may make decisions based on detailed descriptions and travel reviews, which are typical characteristics of the central route (Guo & Pesonen, 2022). When attractive visuals or celebrity endorsements influence consumers in destination advertisements, they may rely more on the peripheral route for decision-making (El Hedhli et al., 2021). In applying the ELM model, tourism marketing researchers often explore the impact of different routes on consumer attitudes. Some studies suggest that information processed through the central route is more likely to result in enduring attitude changes, which significantly affect loyalty to the tourist destination (Dedeoğlu et al., 2021). While the peripheral route may lead to short-term attitude changes, its durability and persuasiveness are relatively weaker (Petty et al., 1999). Therefore, establishing good tourism marketing strategies depends on knowing the route choices of consumers under various conditions.

Like traditional human influencers, VIs can influence consumer attitudes and behaviours through various channels (Meng et al., 2025). On the central route, VIs can prompt deep thinking and the formation of stable attitudes by providing high-quality information, such as detailed travel guides and destination recommendations (Park et al., 2024). When processing information through the peripheral route, consumers may be impacted by virtual influencers (VIs) who present visually engaging, interactive, and human-like characteristics. These surface-level cues can subtly shape emotional responses and influence behavioural intentions (Yang et al., 2024). Within this context, the Elaboration Likelihood Model (ELM) provides a useful conceptual framework for exploring the nuanced ways in which VIs exert influence across different levels of consumer engagement.

AI-generated Information Quality (GQ) refers to the performance of content generated by artificial intelligence algorithms across multiple dimensions. The core idea is to use AI algorithms to generate content that is both creative and of high quality (Cao et al., 2023; Du et al., 2023). In the study of VIs, the quality of AI-generated information is considered a crucial indicator of the credibility of the information source (Allal-Chérif et al., 2024; Yu et al., 2024). Information produced by advanced AI systems, when of high quality, tends to demonstrate strong accuracy and contextual relevance. Such content not only addresses the informational needs of users but also promotes clearer understanding and greater trust through its coherent and accessible presentation (Sands et al., 2022). Prior research further suggests that the perceived credibility of a source is frequently linked to the quality of the information it provides, with higher quality often reinforcing trust in the source (Khan & Mishra, 2024). Specifically, when AI-generated information excels in accuracy and relevance, the audience is more likely to perceive it as a trustworthy source (Kim et al., 2022). This study proposes the following hypotheses, grounded in theoretical frameworks and prior empirical research.

H1: There is a positive correlation between AI-generated information quality and trustworthiness.

AI Interactive Quality (IQ) refers to the responsiveness, naturalness of interaction, and overall user satisfaction exhibited by an artificial intelligence system when interacting with users (Pelau et al., 2021). In the context of human influencers, interaction quality is considered a key factor in building trust (Jun & Yi, 2020). For VIs, engaging in personalised and real-time interactions with users through AI technology not only enhances user engagement but also increases trust in the VI (Yang et al., 2023). For VIs, engaging in personalised and real-time interactions with users through AI technology not only enhances user engagement but also increases trust in the VI (Jun & Yi, 2020). Consequently, this study posits the hypothesis:

H2: There is a positive correlation between AI interactive quality and trustworthiness.

The core of Personalisation (PS) lies in tailoring the image and interactive content to resonate with the audience's needs and interests, thereby enhancing their sense of identification and engagement (Chandra et al., 2022). In the realm of VIs, personalisation is not only reflected in content generation but also in the design and identity construction of the VI (Lim & Lee, 2023).

Research has shown that influencers can effectively bridge the gap with their fans and form a sense of attachment by creating personalised identities and images (Yan et al., 2024). The personalised construction of identity and visual representation not only reinforces users' psychological identification with the influencer but also elevates their sense of enjoyment during interactions (Stein et al., 2022). When influencers successfully present an identity that resonates with the audience through tailored self-expression, user engagement and

perceived enjoyment are notably heightened. This enhanced enjoyment, in turn, contributes to a greater willingness to interact and may extend to increased brand loyalty and emotional attachment. Drawing on established theoretical frameworks and previous empirical studies, the present research formulates the following hypotheses.

H3: There is a positive correlation between personalisation and perceived enjoyment.

Anthropomorphism (AT) refers to the phenomenon of attributing human characteristics, emotions, behaviours, or motivations to non-human entities (Złotowski et al., 2015). Human-computer interaction, especially user experience and trust has been strongly impacted by the advancement of technology, particularly anthropomorphism as a core concept (Troshani et al., 2021). Previous research has revealed that higher levels of anthropomorphism in virtual entities tend to elicit stronger users' emotional responses. The emotional arousal elicited by anthropomorphic design not only fosters deeper user engagement but also contributes to greater enjoyment in mediated interactions (Koike & Loughnan, 2021). When virtual influencers (VIs) are imbued with human-like attributes, users are more inclined to develop emotional bonds, which in turn enhances their perceived enjoyment of the interaction (Kim & Park, 2024). Hence, this study proposes the following hypotheses, grounded in theoretical frameworks and prior empirical research.

H4: There is a positive correlation between anthropomorphism and perceived enjoyment.

Destination Brand Attachment (DBA) is based on the Brand Attachment theory. As the field of tourism marketing has evolved, researchers have begun to focus on how tourists develop an attachment to a destination brand through their emotional experiences and identification with the destination (Huang et al., 2017; Shimul, 2022). Such emotional attachment has been found to shape tourists' intentions to revisit and further strengthen their loyalty and advocacy for the destination (Liu et al., 2020). Research has found that tourists' travel experiences, perceived value, brand trust, and perceived enjoyment are all important factors influencing destination brand attachment (Shang et al., 2020). Perceived pleasure refers to the positive emotions and feelings of pleasure that tourists experience during their interactions with a destination. Pleasant experiences at a destination often strengthen the emotional connection, thereby increasing brand attachment (Kim et al., 2019). However, brand trust (trustworthiness) is also regarded as a critical prerequisite for destination brand attachment. Hence, this study proposes the following hypotheses, grounded in theoretical frameworks and prior empirical research.

H5: Trustworthiness is exhibited in a positive relationship with destination brand attachment.

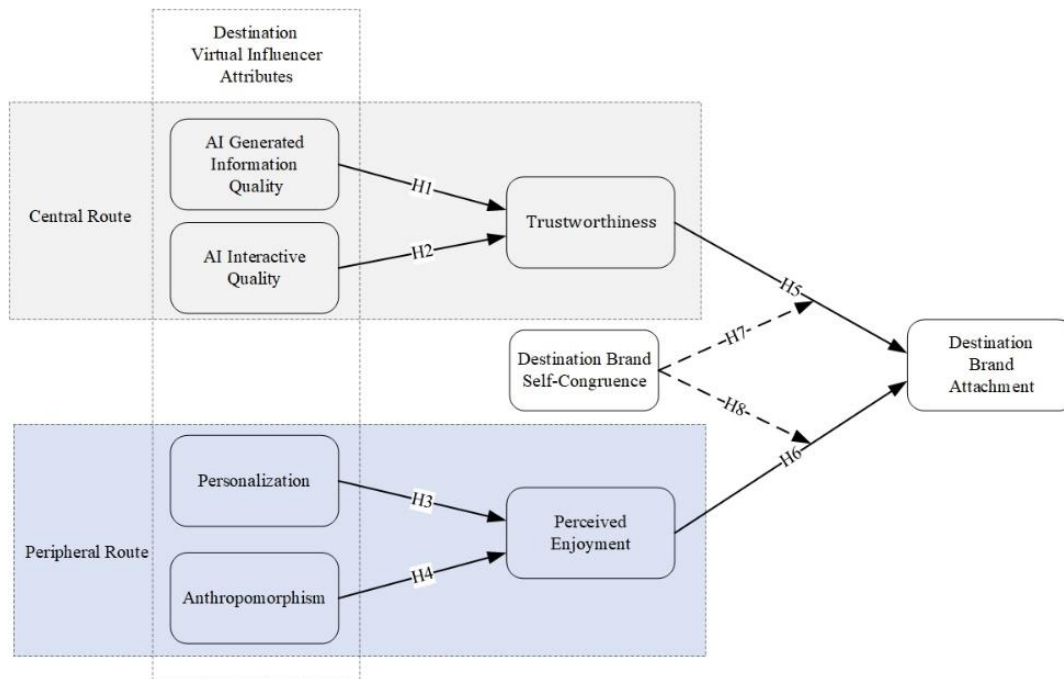
H6: Perceived enjoyment is positively correlated with destination brand attachment.

Destination Brand Self-Congruence (BC) refers to the degree of match between an individual's perceived destination brand image and their self-concept (Huang et al., 2017). Self-congruity theory posits that when individuals perceive external information as consistent with their self-concept, they are more likely to form positive cognitive evaluations and behavioural intentions (Wu et al., 2018). Destination brand self-congruence refers to the alignment between a tourist's perceptions of their values, interests, and lifestyle and the brand image of a specific tourist destination (Yang et al., 2022). Research has shown that higher levels of BC can enhance tourists' satisfaction and loyalty. Trust is widely recognized as a crucial factor in establishing long-term relationships between consumers and brands (Ahn et al., 2013). If the destination brand accurately reflects the tourist's self-concept, this self-congruence may amplify the positive effects of perceived enjoyment (Huang et al., 2017). This study proposes the following hypotheses, grounded in theoretical frameworks and prior empirical research.

H7: The relationship between trustworthiness and destination brand attachment is positively moderated by destination brand self-congruence.

H8: The relationship between perceived enjoyment and destination brand attachment is positively moderated by destination brand self-congruence.

Figure 1: Conceptual Framework



3. Research Methodology

This study employed a quantitative research method and utilised PLS-SEM techniques. To ensure the reliability and validity of the data, we designed and distributed a questionnaire to collect the data. The questionnaire included necessary scale items, all of which were derived from well-validated scales in previous studies, ensuring the effectiveness and reliability of the measurement tools (Clark & Watson, 2019). A 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree," was used to evaluate respondents' responses to various questions in the questionnaire. The questionnaire was designed and distributed using the professional online survey platform (Questionnaire Star), and the data collection procedure was conducted entirely online. Additionally, social media platforms were fully utilised to disseminate the questionnaire link more widely, increasing the diversity and representativeness of the sample. The online respondents were primarily from Zhejiang and Jiangxi provinces in China. A total of 405 questionnaires were distributed, and 388 valid responses were ultimately received.

The gender distribution of the final respondents was as follows: female respondents accounted for 53.86% of the total, while male respondents accounted for 46.13%, as indicated by the fundamental information. In terms of age structure, the sample was predominantly concentrated among individuals between the ages of 18 and 34, with the 18-24 age group being the largest, accounting for 32.73%. The data suggest that the sample was primarily composed of younger adults. The majority of respondents reported a monthly income of less than RMB 8,000, with the largest proportion earning below RMB 3,000. The sample was predominantly composed of students (32.99%) and employed individuals (31.70%). In terms of marital status, most participants were unmarried, accounting for 71.39% of the total sample, while married individuals comprised 28.60%. Overall, the sample was mainly composed of young, well-educated individuals who were mostly unmarried and had relatively lower incomes, with a diverse but predominantly student and employed population.

Common Method Variance (CMV) was evaluated in this investigation. The systematic error induced by the characteristics of the data collection method is referred to as CMV, which can distort research results and lead to inaccurate estimates of the relationships between variables (Tehseen et al., 2017). The study utilised the Variance Inflation Factor (VIF), a statistical measure that assesses multicollinearity, or the correlation between one explanatory variable and other explanatory variables (Daoud, 2017). High VIF values suggest a high degree

of correlation among variables, which may be the result of common method bias. Generally, a variable is considered to have a severe multicollinearity problem if its VIF value exceeds 10 (Kim, 2019). However, it is often suggested that when $VIF > 3.3$, we should pay attention to whether the relationships among these variables are affected by common method bias. The VIF values ranged from 1.026 to 3.779, indicating that there were no serious issues with multicollinearity.

Table 1: Demographic and Geographic Profile

Characteristics	Description	Count	Percentage
Gender	Male	179	46.13
	Female	209	53.86
Age	18-24	127	32.73
	25-29	93	23.97
	30-34	79	20.36
	35-39	69	17.78
	40-44	13	3.35
	45-49	7	1.80
Personal Total Income (per month)	Under RMB 3000	128	32.99
	RMB 3,001- RMB 5,000	83	21.39
	RMB 5,001- RMB 8,000	87	22.42
	RMB 8,001- RMB 12,000	66	17.01
	RMB 12,000 and above	24	6.19
Professions	Employed	123	31.70
	Student	128	32.99
	Freelance	46	11.86
	Unemployed	41	10.57
	Others	50	12.87
Marital Status	Single	277	71.39
	Married	111	28.60
Education Background	Primary/Middle School	22	5.67
	High School	68	17.52
	College degree	77	19.85
	Bachelor's	135	34.79
	Master / PhD	86	22.16

4. Results and Findings

The study conducted a comprehensive assessment of the measurement model to guarantee the quality and reliability of the survey data. This assessment included tests of Composite Reliability (CR), Average Variance Extracted (AVE), and item loadings (Hair et al., 2012). In particular, the CR values for all latent variables exceeded the recommended threshold of 0.7, suggesting that our measurement model has strong internal consistency (Hair et al., 2021). Furthermore, the AVE values were either equal to or greater than 0.5, indicating that each latent variable effectively captured more than half of the variance of its measurement items. Consequently, the measurement model exhibited sufficient convergent validity (Hair et al., 2014). The internal structure of the measurement model is further supported by the fact that all standardised loadings were substantially greater than 0.7 from the perspective of item loadings. Hair et al. (2019) suggest that each item is highly correlated with its respective latent variable. Additionally, the study performed discriminant validity assessments by contrasting the correlations among latent variables with the square roots of their corresponding average variance extracted (AVE) values. The findings indicated that the square roots of AVEs typically exceeded the correlations, thus affirming that the latent variables possess strong discriminant validity (Hair et al., 2019; Hair et al., 2014).

Table 2: Results of Factor Analysis

Item	loading	Alpha	CR	AVE	Sources
AI-generated information quality		0.861	0.763	0.678	
The travel information of the VI is understandable.	0.828				Perez-Vega et al. (2018)
The travel information of the VI is clear.	0.776				
The travel information provided by the VI is of high quality.	0.850				
AI Interactive Quality		0.866	0.766	0.682	
It is easy to communicate with the VI to convey my point.	0.845				Cheung et.al., (2019)
It is possible to have a two-way interaction with VI	0.772				
VI would respond to me quickly and efficiently.	0.820				
Personalisation		0.871	0.771	0.687	
The information and answers sent to me by the VI are customised according to my requests and questions.	0.856				Baabdullah et al. (2022)
VI makes me feel that I am a unique customer.	0.797				
VI offers a customised travel information search.	0.856				
Anthropomorphism		0.853	0.755	0.67	
VI is natural; I do not feel fake about it.	0.866				Balakrishnan et al. (2022)
VI feel lifelike and not artificial.	0.769				
VI is conscious of its actions.	0.833				
Trustworthiness		0.856	0.756	0.672	
The VI is honest.	0.831				Masuda et al., (2022)
This VI is trustworthy.	0.793				
The content provided by this VI is authentic.	0.851				
Perceived Enjoyment		0.869	0.769	0.685	
I like to chat with a VI	0.831				Pereira et al., (2021)
It is fun to share a conversation with a VI	0.788				
Interacting with VI is exciting.	0.862				
Destination Brand Self-Congruence		0.886	0.785	0.7	
The personality of this destination brand aligns with my perception of myself.	0.853				Chen et al. (2020)
The personality of this destination brand reflects me	0.774				
The personality of this destination brand aligns closely with my own.	0.857				
Destination Brand Attachment		0.843	0.743	0.661	
I am attached to this VI endorsement destination.	0.846				Rather et al., (2020)
I feel affection for this VI endorsement destination.	0.778				
I am connected with this VI endorsement destination.	0.834				

Structural Model Assessment

In this study, we evaluated the provided theoretical hypotheses by examining the structural model and conducting a comprehensive analysis using statistical indicators, including path coefficients, t-statistics, and p-values (Hair et al., 2021; Sarstedt et al., 2020). Path coefficients indicate the magnitude of the influence of

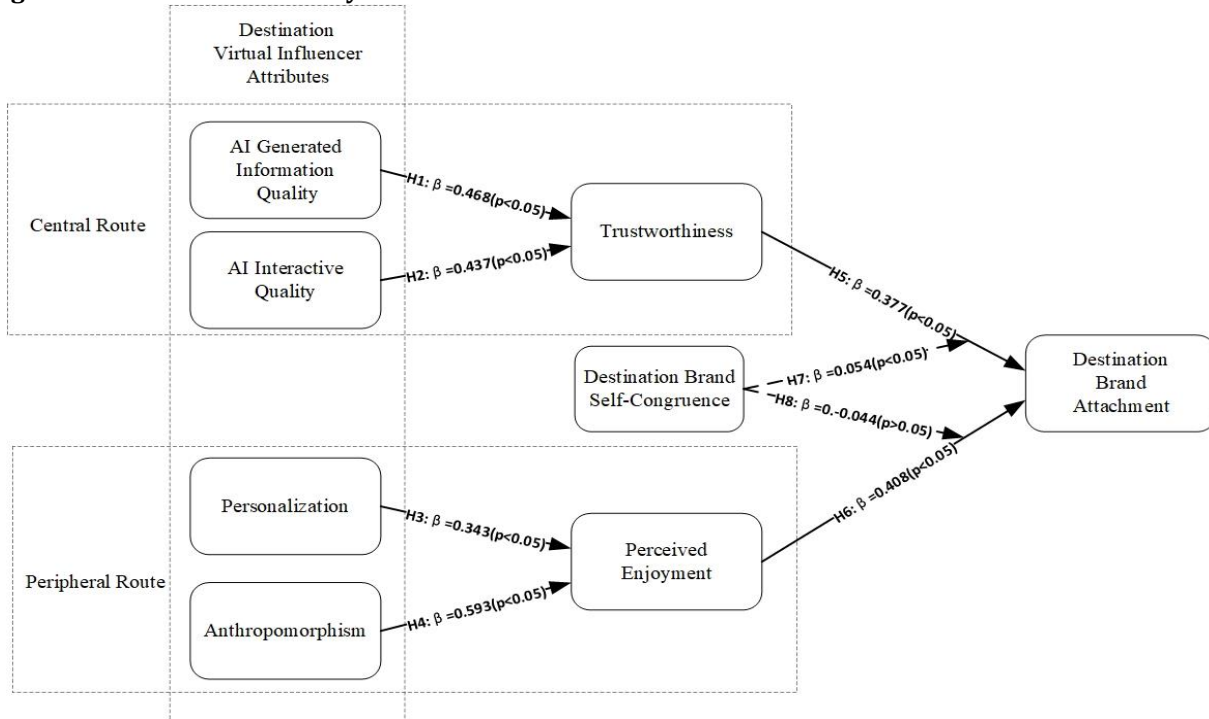
independent factors on dependent variables, whereas t-statistics and their associated p-values assess the significance of the path coefficients (Hair et al., 2013).

The results showed that all proposed hypotheses (H1 to H6) were supported, indicating statistical significance ($p < 0.05$). Specifically, for hypothesis H4 (AT→PE), which posits the effect of Anthropomorphism on Perceived Enjoyment, the path coefficient was 0.593, with a t-statistic of 10.447 and a p-value of 0, indicating a strongly significant relationship. Similarly, hypotheses H1 (GQ→TW), H2 (IQ→TW), H6 (PE→BA), H3 (PS→PE), and H5 (TW→BA) also demonstrated significant path relationships. The path coefficients were 0.486, 0.437, 0.408, 0.343, and 0.377, respectively, with corresponding t-statistics of 8.771, 8.14, 7.017, 5.905, and 5.832, and p-values of 0, indicating that the relationships among these variables are statistically significant.

Table 3: Hypothesis Testing

Hypothesis	Relationship	Path coefficients	T statistics	P values	Remark
H1	GQ → TW	0.486	8.771	0.000	Supported
H2	IQ → TW	0.437	8.14	0.000	Supported
H3	PS → PE	0.343	5.905	0.000	Supported
H4	AT → PE	0.593	10.447	0.000	Supported
H5	TW → BA	0.377	5.832	0.000	Supported
H6	PE → BA	0.408	7.017	0.000	Supported

Figure 2: Results of Path Analysis



Moderation Effect Analysis

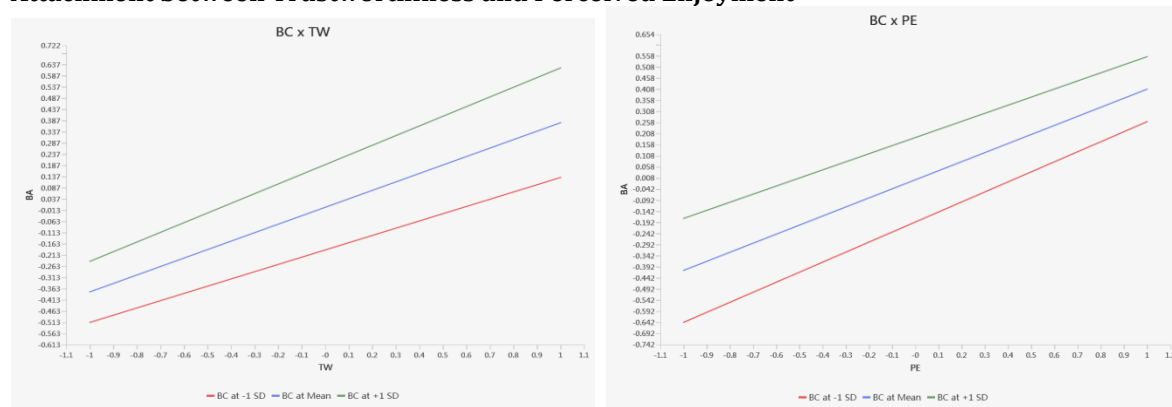
To evaluate the role of potential moderating variables, researchers conducted a moderation analysis to explore how direct effects vary under different conditions (Matthews et al., 2018). The analysis specifically examined the interaction effect between BC (Destination Brand Self-Congruence) and TW (Trustworthiness) on BA (Destination Brand Attachment), as well as the interaction effect between BC and PE (Perceived Enjoyment) on BA. The findings indicated that the path coefficient for the interaction term between BC and TW on BA was

0.054, accompanied by a t-statistic of 2.605 and a p-value of 0.004, signifying a substantial moderating impact. The data suggest that when considering BC, the positive impact of TW on BA varies with different levels of BC, meaning that BC enhances the positive effect of TW on BA. The result provides strong support for Hypothesis BC x TW → BA. However, when examining the interaction term between BC and PE on BA, the path coefficient was -0.044, with a t-statistic of 0.486 and a p-value of 0.627, indicating that this moderation effect is not significant. Therefore, Hypothesis BC x PE → BA was not supported, suggesting that BC does not alter the manner or strength of the effect of PE on BA.

Table 4: The Results of the Moderating Effect

	Path coefficients	T statistics	P values	Remarks
BC x TW → BA	0.054	2.605	0.004	Supported
BC x PE → BA	-0.044	0.486	0.627	Unsupported

Figure 3: The moderating effect of Destination Brand Self-Congruence on the Destination Brand Attachment between Trustworthiness and Perceived Enjoyment



Discussion

This study employed PLS-SEM to incorporate the ELM and examine how VIs influence destination brand attachment via both central and peripheral channels. The main findings validated the positive impact of VIs' AI-generated information quality, AI interactive quality, personalisation, and anthropomorphism on trustworthiness and perceived enjoyment. These findings not only support the hypothesised path relationships but also further reveal the promotional role of VI endorsements in fostering destination brand attachment.

The findings demonstrate a substantial positive link between the quality of AI-generated material and the audience's faith in VIs, aligning with the current literature. Likewise, interactive quality was demonstrated to be a significant influence in augmenting trust. VIs, through timely responses and personalised interactions, increased user engagement and satisfaction, thereby strengthening their attachment to the brand. Additionally, personalisation and anthropomorphism significantly enhanced users' perceived enjoyment. By incorporating anthropomorphic characteristics and delivering personalised, interactive content, virtual influencers (VIs) effectively enhance users' emotional engagement, which in turn facilitates a stronger emotional attachment to the destination brand. The study reveals that perceived enjoyment not only increases brand attachment but also enhances users' intentions to revisit and brand loyalty.

The study investigated the moderating effect of destination brand self-congruence on the links among trust, subjective enjoyment, and brand attachment. The results showed that brand self-congruence significantly enhances the positive effect of trust on brand attachment, indicating that when the destination brand image is highly congruent with users' self-concepts, increased trust further promotes brand attachment. Nonetheless, the interaction study between brand self-congruence and reported enjoyment revealed no significant moderating influence. This indicates that the humanistic characteristics of virtual agents independently enhance reported happiness without a significant correlation with self-congruence.

5. Conclusion

By introducing the ELM model in the study, the findings systematically reveal how VIs affect users' perceptions and brand attachment through both central and peripheral routes. The central route primarily involves the transmission of high-quality information, leading to deep cognitive processing and more enduring attitude changes. Conversely, the peripheral route leverages external characteristics of VIs, such as visual appeal and interactivity, to prompt emotional decisions. Through this theoretical framework, the study systematises the dual-path persuasion mechanism of VIs for the first time, deepening our understanding of the psychological mechanisms at play under different paths. This research examines particular characteristics of virtual influencers, including personalisation and anthropomorphism, and illustrates their substantial effect on users' perceived satisfaction and brand trust. These findings not only enhance the current study on the impact of VIs but also establish a robust theoretical framework for further investigation into how these characteristics influence user psychology and behaviour. The study also presents the moderating influence of destination brand self-congruence in VI marketing. This theoretical contribution deepens our understanding of the connection between consumers' self-concepts and brand attachment, particularly in the context of virtual brand interactions. It highlights the significance of the alignment between the destination brand image and users' self-concepts on brand loyalty and the inclination to revisit.

From a practical viewpoint, this study offers several insights for DMOs. Firstly, when leveraging VIs for marketing, DMOs should focus on enhancing the information quality and interactivity of these VIs to strengthen users' trust and engagement. By engaging in effective personalised interactions with users, VIs can increase perceived enjoyment and emotional connections, thereby enhancing brand attachment. Additionally, DMOs should concentrate on the self-congruence between the destination brand image and the target tourists. By designing virtual endorsers that align with the self-concepts of the tourists, DMOs can further enhance the brand's appeal and user loyalty. According to the findings of this study, the anthropomorphic features of VIs are crucial in enhancing brand attachment. Therefore, DMOs should focus on the authenticity and attractiveness of the anthropomorphic characteristics when designing VIs to boost tourists' emotional identification and enjoyment.

The ELM is suited for analysing information processing and persuasion pathways, even though this study used it as a theoretical framework to investigate how VIs impact consumers' perceptions and brand attachment through both central and peripheral channels. The study lacks broader foundational theoretical support in some respects. Additionally, certain aspects of the study's findings were not as robust as expected. While the study validated the impact of personalisation and anthropomorphism on perceived enjoyment and brand attachment, the influence of some variables did not meet expectations in different contexts. This may be related to the varying characteristics of VIs, platform features, or differences in user backgrounds. The sample in this study was predominantly derived from specific regions in China. It was primarily composed of younger, well-educated individuals, with a lack of comprehensive coverage of other cultural backgrounds and age groups. This sample selection may influence the external validity of the research conclusions.

To verify the generalizability of the findings, future research should expand the sample to include a more diverse audience and participants from different cultural backgrounds. Furthermore, studies could integrate theories from AI and virtual reality to explore the role of VIs in an evolving technological landscape. The integration of these technologies and theories can not only fill existing theoretical gaps but also drive innovative applications of VIs in brand marketing.

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