



Does Disclosing a Digital Human's Identity Mitigate the Negative Emotions that Anthropomorphic Endorsements May Elicit?

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Abstract. Within the digital economy, virtual digital humans have become a prominent communication technology and are increasingly used in commercial practice. Centring on luxury-brand endorsements and drawing on the uncanny valley effect, this study employs a questionnaire survey and empirical analysis to assess consumers' perceptual responses and brand favourability across multiple experiential dimensions. Results show that endorsement posters featuring digital-human technology reduce consumers' brand favourability. To lessen perceived eeriness or behavioural strangeness, firms should enhance interaction and foster identification between digital humans and consumers. Moreover, the psychological distance between luxury brands and consumers plays a mediating role in the link between digital-human endorsement posters and brand favourability, corroborating the presence of an uncanny valley effect in virtual endorsement contexts.

Keywords: Virtual Digital Humans, Identity Disclosure, Anthropomorphism, Uncanny Valley Effect

1 Introduction

Within the digital economy, virtual digital humans have become a prominent communication technology and are now widely used in commercial practice. Technologically, they are virtual personae created via human–computer interaction, natural language processing and affective computing, and they display anthropomorphic traits .[1] Two advantages are notable: 1.operators can craft their social identity and choreograph both non-verbal and verbal behaviours using digital tools; and 2.their affect remains stable, avoiding sharp fluctuations and supporting sustained, continuous operation. Owing to these strengths, virtual digital humans are taking on a growing role in marketing—from food and beauty to snacks, product launches and new-product publicity. The luxury sector, a bellwether of global fashion and quality, has similarly embraced digital-human technology to seek fresh advances

in promotion. In February 2022, the Chinese virtual influencer AYAYI shared a social-media promotion for Tiffany's Knot collection.

Some luxury brands have already deployed digital-human technology, yet its effectiveness remains contested. Consumers can show resistance—even strong aversion—when confronted with recommendations delivered by digital humans [2]. Digital humans also frequently struggle to address personalised queries, which erodes consumer trust [3]. Research on digital-human endorsements is still at an exploratory stage: most work emphasises consumer benefits, while potential downsides are under-examined. Against this backdrop, the present study situates itself in the luxury sector and explores consumers' psychological responses to digital-human endorsements. Specifically, it assesses whether such endorsements trigger negative emotions when “errors” occur and considers how best to manage those emotions. The goal is to help luxury brands avoid the adverse consequences of improper implementation as they scale digital-human endorsement initiatives.

The study centres on digital-human endorsements within luxury branding. It examines the potential negative effects on consumers, and proceeds to analyse specific mitigation strategies alongside marketing models that leverage digital-human technology to strengthen endorsement effectiveness. For the experimental stimuli, both virtual digital humans and virtual mascots are employed—each a virtual persona—to minimise the preconceptions that real-person endorsements might evoke in consumers.

2 Literature Review

Digital-human endorsements have gathered momentum in recent years. Most studies consider their upside for brands: positioned as “high-tech” and “innovative”, digital humans attract attention through distinctive looks and crafted personas. They increasingly sidestep the limitations of real-world celebrities, using novel, engaging designs to meet consumers' appetite for the new—opening promising avenues for luxury brands. As products of computer programming, digital humans are unconstrained by physiology and can work continuously and with consistent rationality, thereby mitigating risks arising from celebrities' personal moods or behaviour. Aligning with younger consumers' enthusiasm for fashion and technology, they can narrow the psychological distance to the brand and foster brand loyalty.

Although new technologies bring clear benefits to commerce, they also carry limitations that warrant careful attention and mitigation. Existing work on virtual digital humans tends to describe phenomena rather than probe underlying mechanisms, and offers little guidance on how to address the drawbacks—an omission of particular concern to luxury brands. In practice, digital-human and real-person endorsements differ in important ways. Consumers typically regard digital humans' distal sensory capabilities—vision and hearing—as comparable to those of human influencers, but perceive marked deficits in the proximal senses of taste, touch and smell, diminishing the experiential appeal of luxury offerings. When confronted with personalised or [4]novelty-seeking queries, digital humans must rely on their

stored knowledge bases—their “brains”—and often fall short of delivering targeted answers.[5] Where deeper emotional exchange is needed, they struggle to provide the empathetic, attentive responses that people can, which undermines perceived authenticity, depresses purchase intention and brand approval, and may even elicit resistance or aversion.[2] Consequently, digital-human endorsements in the luxury sector can entail negative consequences: difficulty forging deep emotional bonds with consumers and, if mishandled, weakened marketing effectiveness. Firms should therefore harness the promotional advantages of digital humans while proactively identifying and mitigating potential pitfalls—an impetus for the present study.

3 Theoretical Background and Research Hypotheses

3.1 Theoretical Background

The uncanny valley effect is a hypothesis about how people respond to robots and other non-human entities. First articulated by the Japanese scholar Masahiro Mori, it explains why observers display either positive or negative reactions to human-like forms (Mori, 1970).[6] As an artefact's appearance and movement become more human, empathy tends to increase; yet when virtual humans are highly realistic without being fully human, the brain's visual processing can be unsettled, producing a markedly negative affective response (Mende et al., 2019).[7] In luxury branding, virtual digital-human endorsers aim for a high degree of anthropomorphism to build deep emotional connections and stimulate purchase desire, which makes the potential downsides of the uncanny valley effect particularly hard to avoid.

3.2 Research Hypotheses

The Impact of Digital-Human Endorsements on Brand Favourability.

Brand endorsers constitute an effective vehicle for brand promotion, supporting brand awareness, the building of brand trust and the development of brand associations. Mind perception—the attribution of mental states to others—sits at the core of anthropomorphism. While individuals can experience their own thought processes, they cannot directly perceive those of others; accordingly, inferring others' minds has become a focal topic in social cognition and behaviour. When digital humans display a high degree of anthropomorphism, observers find it easier to attribute mind to them. Enriching the endorser's anthropomorphic background information can heighten perceived anthropomorphism and help mitigate the potential downsides associated with high anthropomorphism. This fosters identification with brand values, bolsters trust in luxury brands and strengthens brand loyalty. By contrast, if the appearance of a virtual digital-human endorser triggers negative emotions, consumers' trust in the luxury brand is likely to diminish markedly, with knock-on effects for brand loyalty. Hence, Hypothesis 1 is advanced:

H1: Luxury-brand endorsement posters employing digital-human technology exert a negative effect on consumers' brand favourability.

Digital-Human Innovation and the Emotional Response Mechanism in Marketing.

Digital-human technology injects freshness into luxury-brand communications by delivering novel and distinctive content and advertising. This differentiation can heighten brand appeal and value by signalling perceived innovativeness. Yet innovation can also be opaque to some consumers, inadvertently widening the psychological distance from the brand. Emotional marketing begins with consumers' affective needs: it aims to trigger emotional resonance and weave feeling into marketing, thereby strengthening brand loyalty. In luxury settings, perceptions of innovativeness work through an affective mechanism. Effective luxury brands can cultivate an emotional response mechanism in digital-human marketing—eliciting positive reactions such as novelty, pleasure and emotional attachment—whereas poorly executed emotional marketing may provoke negative responses, including perceived unease. Hence, we advance the following hypothesis:

H2: Psychological distance between luxury brands and consumers plays a mediating role between digital-human-based luxury endorsement posters and consumers' brand favourability.

4 Research Design and Data Analysis

4.1 Research Design

Building on user experience, the study drew on established, publicly available scales and sought expert input from luxury-industry practitioners. The resulting experiential marketing scale comprised 15 items. Perceived eeriness was measured using five items adapted from Gray and Wegner's (2007)[8] three-item approach to capturing uncanny perceptions in the context of the uncanny valley effect. For brand favourability, the model treats sensory, affective, cognitive, behavioural and relational experiences as independent variables, specifies perceived eeriness as the mediator, and regards brand favourability as the dependent variable.

In total, 240 questionnaires were returned; following screening, 203 were retained as valid (84.6%). Reliability was evaluated via Cronbach's alpha (Appendix Table 1). The coefficients were 0.788 (sensory), 0.817 (affective), 0.762 (cognitive), 0.782 (behavioural), 0.797 (relational), 0.877 (perceived eeriness) and 0.872 (brand favourability), indicating high reliability and alignment with the study's aims, thereby supporting subsequent factor analysis. Validity was assessed using the KMO statistic and Bartlett's test of sphericity (Appendix Table 2). The KMO was 0.939; Bartlett's chi-square was 4123.010 with 300 degrees of freedom, with significance $0.000 < 0.05$, confirming that the data meet validity requirements and are appropriate for further factor analysis.

4.2 Sample Information

Appendix Table 3 summarises the sample profile. Females slightly outnumber males (52.71%). Most respondents are aged 19–50 (79.47%), with the 19–30 bracket the largest (36.45%). By occupation, corporate employees form the biggest group (37.44%), followed by civil servants and public-institution staff (27.59%). In terms of education, junior college (associate) and upper-secondary/vocational secondary qualifications are most common (29.56% and 26.11%, respectively), while 13.79% hold a bachelor's degree or higher. Urban household registration is predominant (65.52%). Reported monthly income clusters between CNY 5,001 and 10,000, comprising 45.80% of the sample.

4.3 Regression Analysis Results

Controlling for demographic variables, as shown in Table 1, sensory experience was negatively related to perceived eeriness (coefficient = -0.140 ; $T = 2.174$; $P < 0.05$), indicating a significant effect.

Affective experience was likewise negatively associated with perceived eeriness (coefficient = -0.225 ; $T = 2.920$; $P < 0.01$). Cognitive experience showed a significant negative effect (coefficient = -0.129 ; $T = 2.321$; $P < 0.05$), as did behavioural experience (coefficient = -0.151 ; $T = 2.153$; $P < 0.05$). The strongest effect was for relational experience (coefficient = -0.340 ; $T = 4.980$; $P < 0.001$), highlighting its salient role in reducing perceived eeriness.

For brand favourability, sensory (coefficient = 0.197 ; $T = 3.208$; $P < 0.01$), affective (0.210 ; 3.454 ; < 0.01) and cognitive (0.162 ; 3.309 ; < 0.01) experiences all exhibit positive, significant effects. Behavioural experience is non-significant (0.054 ; 0.887 ; > 0.05). Relational experience is positive and significant (0.166 ; 2.846 ; < 0.01).

Perceived eeriness has a significant negative effect on brand favourability, with a coefficient of -0.226 ($T = 3.417$, $P < 0.01$). The path model is visualised in Fig. 1. Accordingly, the perceived eeriness associated with virtual digital-human endorsements negatively affects brand favourability. This finding highlights the need for brands to pay particular attention to reducing consumers' perceived eeriness when implementing virtual digital-human endorsement strategies, in order to enhance brand image and favourability. Brands can optimise the design, movements and interaction modes of virtual digital humans to make them closer to human behaviour and to reduce feelings of unnaturalness or discomfort. They can also strengthen the emotional connection between virtual digital humans and consumers—through storytelling and emotional resonance—to increase acceptance and liking, thereby further improving brand favourability.

Table 1. Path Analysis

	β	Standard deviation	T statistics	P values
Sensory Experience -> Perceived	-0.140	0.064	2.174	0.030

Eeriness				
Affective Experience -> Perceived Eeriness	-0.225	0.077	2.920	0.004
Cognitive Experience -> Perceived Eeriness	-0.129	0.056	2.321	0.020
Behavioural Experience -> Perceived Eeriness	-0.151	0.070	2.153	0.031
Relational Experience -> Perceived Eeriness	-0.340	0.068	4.980	0.000
Sensory Experience -> Brand Favourability	0.197	0.061	3.208	0.001
Affective Experience -> Brand Favourability	0.210	0.061	3.454	0.001
Cognitive Experience -> Brand Favourability	0.162	0.049	3.309	0.001
Behavioural Experience -> Brand Favourability	0.054	0.061	0.887	0.375
Relational Experience -> Brand Favourability	0.166	0.058	2.846	0.004
Perceived Eeriness -> Brand Favourability	-0.226	0.066	3.417	0.001

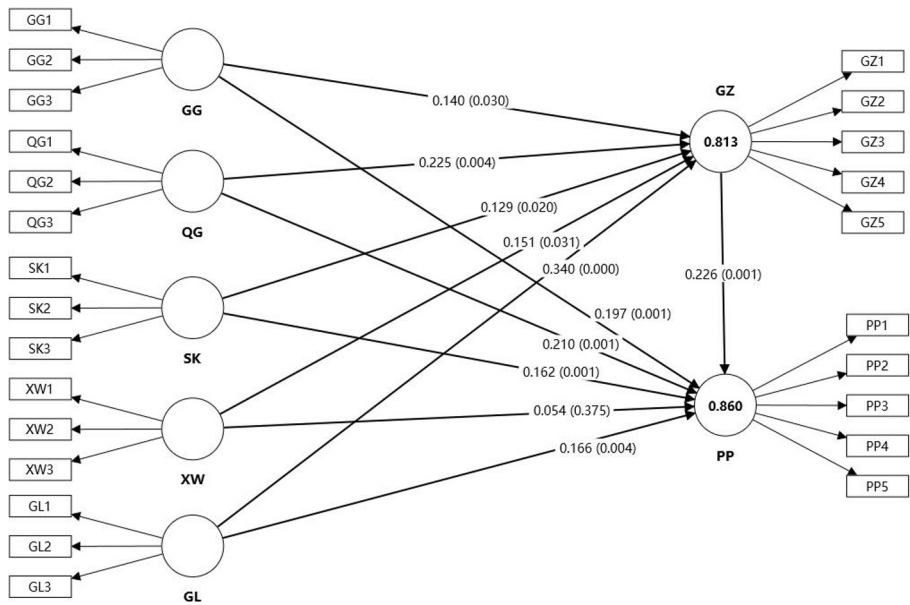


Fig. 1. Empirical Results

5 Conclusions and Recommendations

Framed within luxury-brand endorsements featuring virtual digital humans and informed by the uncanny valley effect, this study uses a questionnaire survey and empirical analysis to assess consumers' perceptual responses and brand favourability across multiple experiential dimensions. Results indicate that endorsement posters employing digital-human technology reduce brand favourability. To mitigate perceived eeriness, firms should deepen interaction and foster identification between digital humans and consumers. Moreover, the psychological distance separating luxury brands from consumers mediates the link between digital-human endorsement posters and brand favourability, confirming the operation of the uncanny valley effect in virtual endorsement contexts.

Drawing on the study's findings, we offer three recommendations for luxury brands:

First, sharpen brand positioning and pinpoint the target consumer group. Prior to developing a virtual digital human, define the brand's core values and tone of voice at a strategic level so that the market clearly receives a premium, art-led brand character.

Second, upgrade the virtual digital human on a regular basis to improve brand–endorser fit and creative distinctiveness. Exploit the medium's flexibility and innovativeness to deliver greater emotional value and a warmer brand experience, thereby lifting brand favourability.

Third, deepen emotional connection between digital humans and consumers. Embed narrative storytelling to foster identification and human warmth. Additionally, schedule live-streamed interactions—e.g., ahead of product launches or for limited-edition collections—so the virtual digital human can provide immersive explanations and demonstrations.

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Appendix

Appendix Table 1. Reliability Analysis

Dimension	Name	Corrected Item–Total Correlation	α Item Deleted	Cronbach α
Sensory Experience	GG1	0.605	0.737	0.788
	GG2	0.643	0.698	
	GG3	0.641	0.700	
Affective Experience	QG1	0.687	0.729	0.817
	QG2	0.639	0.778	
	QG3	0.680	0.736	
Cognitive Experience	SK1	0.602	0.674	0.762
	SK2	0.582	0.699	
	SK3	0.602	0.673	
Behavioural Experience	XW1	0.625	0.700	0.782
	XW2	0.620	0.705	
	XW3	0.615	0.711	
Relational Experience	GL1	0.605	0.759	0.797
	GL2	0.701	0.655	
	GL3	0.617	0.747	
Perceived Eeriness	GZ1	0.699	0.854	0.877
	GZ2	0.664	0.861	
	GZ3	0.728	0.847	
	GZ4	0.742	0.843	
	GZ5	0.708	0.851	
Brand Favourability	PP1	0.636	0.859	0.872

PP2	0.696	0.845
PP3	0.683	0.849
PP4	0.751	0.831
PP5	0.728	0.837

Appendix Table 2. KMO and Bartlett's Test

KMO Value	0.939
Approximate Chi-Square	4123.010
Bartlett's Test of Sphericity	df
	300
	p-value
	0.000

Appendix Table 3. Demographic Frequency Analysis Results

Name	Options	Frequency	Percentage (%)
Gender	Male	96	47.29
	Female	107	52.71
Age	Under 18	24	11.82
	19–30	74	36.45
	31–50	65	32.02
	50 and Above	40	19.70
	Civil Servants / Public-Institution Staff	56	27.59
Occupation	Corporate Employees	76	37.44
	Self-Employed	20	9.85
	Freelancers	4	1.97
	Students	24	11.82
	Unemployed	4	1.97
	Farmers	2	0.99
	Healthcare Workers	9	4.43
	Teachers	2	0.99
	Other	6	2.96
	Primary or Below	22	10.84
	Lower Secondary	40	19.70
	Upper-Secondary or Vocational	53	26.11
Educational Attainment	Secondary	60	29.56
	Junior College (Associate)	28	13.79
	Bachelor's Degree and Above	133	65.52
Household Registration	Urban Household Registration	70	34.48
	Rural Household Registration	24	11.82
Monthly Income (CNY)	≤3,000	35	17.24
	3,001–5,000	67	33.00
	5,001–1,000		

Name	Options	Frequency	Percentage (%)
	10,001–15,000	46	22.66
	≥15,00	31	15.27

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