

The Effect of Anthropomorphism of Female Virtual Influencers on Women's Objectification and Social Comparison

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A recent development in the fashion industry has been the rise of virtual influencers (hereafter, VIs). Regardless of whether they closely resemble humans or adopt more artificial forms, VIs are fundamentally digital avatars designed to mimic various human traits, including appearance and communication style. While VIs function as communicators for diverse media content, they are predominantly utilized to generate interest in brands' products and services, much like human influencers. Furthermore, being fully controllable, ageless, available 24/7, and cost-effective, they have gained significant traction in the marketing landscape.

Despite their commercial success, however, scholars have recently begun to problematize VIs' close, idealized imitation of the human body (e.g., Shin & Lee, 2023). Beauty norms now manifest in these versatile digital bodies through either highly humanlike forms (e.g., Shudu) or animated, stylized forms (e.g., Noonnouri). For instance, Shudu features perfect proportions derived from top models, while Noonnouri exaggerates ideal features through unrealistically big eyes and slim limbs. Despite differences in the level of anthropomorphism, such stereotypical body depictions can ultimately raise women's appearance standards and harm their appreciation of their own bodies (Sherman & Zurbriggen, 2014), deserving scholarly attention. Nonetheless, as most existing studies have heavily focused on VIs' marketing effectiveness (Laszkiewicz & Kalinska-Kula, 2023), the psychological impact of reproduced digital physiques remains largely underexplored.

To fill this gap, we investigate how female VIs influence women's objectification and social comparison, with a focus on the role of VI anthropomorphism. Anthropomorphism refers to the extent to which nonhuman entities are endowed with humanlike features and, in turn, critically reduces people's psychological distance toward artificial beings. Grounded on social comparison theory (Festinger, 1954) and objectification theory (Fredrickson & Roberts, 1997), we argue that anthropomorphism critically shapes the mechanism by which women relate to female VIs' appearances. First, we speculate that high (vs. low) levels of anthropomorphism may be more harmful because they increase social comparisons, mediated by greater perceived similarity. Although social comparison theory broadly explains women's persistent comparisons with attractive others, it holds that targets must be sufficiently similar for such a deliberate process to occur (Festinger, 1954; Leahey & Crowther, 2008). In interactions with VIs, VI anthropomorphism will reduce feelings of difference stemming from their artificial origin and foster a sense of similarity for humans. Since such similarity establishes comparability, women will likely make more appearance comparisons with highly anthropomorphic VIs than with lowly anthropomorphic VIs.

While low-anthropomorphic VIs can benefit women's body image by reducing appearance comparisons, their potential harms are speculated when viewed through the lens of objectification theory. This theory posits that entities perceived as lacking autonomy or human capacity are more easily reduced to visual objects and treated as instruments for others' gratification (Fredrickson & Roberts, 1997). This explains consumers' moral disengagement when interacting with less humanized computer agents. For instance, Kim et al. (2023) reported that consumers exhibit more unethical behavior toward AI personnel than toward human personnel, attributed to weakened anticipatory guilt. In the context of VIs, when VIs are less anthropomorphized, they will become more vulnerable to objectification, as they will be seen as mere dolls rather than fully sociable and competent actors, who deserve less respect. According to Zolot (2003), objectification can occur through a lessened moral concern about objectifying the target and through critical evaluation of the target's appearance. Thus, the following hypotheses are suggested:

H1: High (vs. low) VI anthropomorphism leads to lower naturalizing of objectification.

H2: High (vs. low) VI anthropomorphism leads to lower critical evaluation of appearance.

H3: High (vs. low) VI anthropomorphism leads to more appearance comparisons.

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- H4: High (vs. low) VI anthropomorphism leads to greater perceived similarity.
 H5: Perceived similarity is negatively associated with naturalizing objectification.
 H6: Perceived similarity is negatively associated with critical evaluation of appearance.
 H7: Perceived similarity is positively associated with appearance comparison.

We employed a between-subjects experiment with 200 South Korean female social media users aged 18–35, recruited via Macromill Embrain, a professional survey company. For the experimental manipulation, images of attractive female influencers were selected from publicly available Google images. These images were used directly in the *high anthropomorphism condition*. For the *low anthropomorphism condition*, the human-likeness of the same images was reduced using Midjourney's 'stylize' function while preserving overall physical features. All measurement items were adopted from validated scales. Perceived similarity was assessed using a 3-item scale by Ensher and Murphy (1997). Objectification was measured using Zolot's (2003) scale, including naturalizing objectification (4 items) and critical evaluation of appearance (4 items). As the original scale was designed to assess men's objectification of women, items were recontextualized for women's objectifying a female influencer. Appearance comparison was measured using a 3-item scale by Tiggemann and McGill (2004).

For sample characteristics, the mean age was 27.19 years ($SD = 4.08$); while 68% of respondents were aware of VIs, only 17% could name a familiar VI, and 5% had experience of following VIs on social media. Following the measurement validity and reliability checks, structural equation modeling (SEM) was conducted using AMOS 24.0. The model fit was satisfactory: $\chi^2/df = 2.32$, $p < .001$, $CFI = .93$, $TLI = .93$, $IFI = .91$, $RMSEA = .051$.

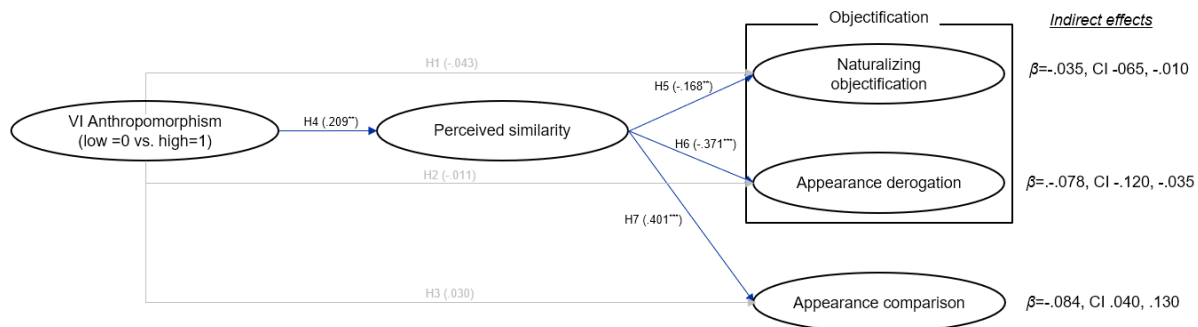
Examining the main effects, the direct pathways from VI anthropomorphism to naturalizing objectifying gaze ($\beta = -.043$, *n.s.*), critical evaluation of appearance ($\beta = -.011$, *n.s.*), and appearance comparison ($\beta = .030$, *n.s.*) were not statistically significant; therefore, H1, H2, and H3 were rejected.

However, the pathways involving the mediator were consistent with the proposed full mediation model (Figure 1). As expected, VI anthropomorphism significantly enhanced perceived similarity ($\beta = .209$), supporting H4. This perceived similarity subsequently reduced the naturalizing of objectification ($\beta = -.168$) and critical evaluation of appearance ($\beta = -.371$), supporting H5 and H6, respectively. Conversely, it led to increased appearance comparison ($\beta = .401$), supporting H7.

A bootstrapping method was further applied with 5,000 resamples and 95% confidence intervals to conduct mediation analysis. The results confirmed the full mediation effects of perceived similarity; specifically, the indirect effects of anthropomorphism through perceived similarity were statistically significant for both naturalizing objectification ($\beta = -.035$, $CI [-.065, -.010]$) and critical evaluation of appearance ($\beta = -.078$, $CI [-.120, -.035]$), as well as for increasing appearance comparison ($\beta = .084$, $CI [.040, .130]$).

Figure 1

Path Analysis Model of Associations Between VI Anthropomorphism and Appearance-Related Responses (Objectification and Appearance Comparison)



Note. Coefficients presented are standardized linear regression coefficients. Age, prior exposure to VIs, and perceived attractiveness of the stimulus VI were included as control variables.

$p < .001^{***}$, $p < .01^{**}$, $p < .05^{*}$

Our study showed that VIs with varying levels of anthropomorphism can have distinct psychological consequences for women. We concluded that highly anthropomorphized VIs elicit a greater sense of similarity, thereby reducing objectification but increasing social comparisons. Conversely, low anthropomorphic VIs weaken this sense of similarity, leading to fewer social comparisons but greater objectification. These findings can be interpreted as follows. The VI anthropomorphism of is neither uniformly harmful nor beneficial but has complex effects. In that anthropomorphism lessens objectification, it can be promotable for VIs' body designs. However, an increase in social comparisons can potentially offset these benefits, because even instant, quick comparisons can make women experience negative mood and self-deprecation, which can all lead to undermining women's lives and psychological well-being.

Our findings provide a preliminary understanding of how VIs affect women's body image. Theoretically, this study explicates the distinct advantages and pitfalls of anthropomorphized VI bodies by drawing on social comparison theory and objectification theory. From a practical standpoint, industry practitioners must recognize that design choices—particularly the degree of anthropomorphism—can inadvertently trigger negative psychological responses. Fundamentally, VI design must incorporate diverse body shapes, races, and ethnicities.

Moving forward, it is crucial to investigate downstream outcomes of VI-induced objectification and appearance comparison (e.g., self-objectification). For instance, girls and women who interact with these virtual characters may be subjecting themselves to an ongoing process of self-objectification during what they may consider harmless media interaction. Given the increasing popularity of VIs and the prevalence of gendered representations therein, it may also be essential to investigate the cumulative and long-term effects of such exposure.

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