The role of psychological distance and construal level in explaining the effectiveness of human-like vs. cartoon-like virtual influencers

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ABSTRACT

Computer-generated virtual influencers (VIs) are increasingly used in advertising as there are many advantages. In four experimental studies, two types of VIs and their impact on advertising effectiveness are compared. Key findings are that highly human-like VIs lead to higher trustworthiness, while a more cartoon-like appearance increases novelty. The reasoning behind the varying evaluation of VI types is explored through the lens of psychological distance and construal level theory, suggesting that appropriate message focus enhances the influencers' benefits as a moderator. It is further shown that different cultural settings play an important role for VI perception, finding that the cartoon-influencer's novelty effect is restricted to consumer groups low in VI familiarity. The studies contribute to the growing literature on VI effectiveness, delivering a theoretical under-pinning for their assessment. Managerially, it is concluded that both cartoon-like and human-like VIs can be successful endorsers, but under careful consideration of various factors.

1. Introduction

In recent years, the advertising landscape has undergone a significant transformation, marked by the rise of digital platforms and innovative technologies (Rodrigo-Martín et al., 2021). This evolution has reshaped traditional approaches to marketing, introducing new avenues for brand promotion (Rodgers, 2021). Initially, the realm of celebrity endorsements experienced a shift towards human influencers (HIs), who are able to create a more relatable connection with audiences (Schouten et al., 2021). However, the latest frontier in this transformative journey involves the integration of virtual influencers (VIs), computer-generated personalities, often endowed with sophisticated fictive personalities, that can be used for all advertising and social media communication purposes that were previously reserved for humans only (Arsenyan & Mirowska, 2021; Byun & Ahn, 2023). The reason for this shift is easily explained, as VIs provide marketers with numerous advantages (Moustakas et al., 2020). They can be tailored precisely to the requirements of a specific advertising campaign, and they remain impervious to aging or compromising the brand's image by avoiding involvement in scandals or controversies (Gerlich, 2023; Thomas & Fowler, 2021). Additionally, they radiate a refreshing sense of novelty and have the potential to capture the interest of younger target groups (Teh, 2021). It is therefore not surprising that experts anticipate a strong increase in VI presence in the future (Appel et al., 2020; Conti et al., 2022). With a current size of $4.6 billion and an expected growth of 26 % by 2025, market data further supports the optimistic outlook for success (Mutani, 2022). Remarkably, numerous leading brands, such as Calvin Klein and Samsung, have already adopted virtual influencers for product promotion (Powers, 2019).

When it comes to the design of VIs, there is a lot of variety concerning the level of visual human-likeness the VIs exhibit. The possibilities range from characters that are barely distinguishable from actual human beings (e.g., Lil Miquela) to other more cartoon-like figures (e.g., Noonoouri) that are anthropomorphized but endowed with exaggerated features, clearly marking them as not real (Arsenyan & Mirowska, 2021).

To sum up, VIs present a promising avenue for marketing strategies as they offer a spectrum of advantages, and the further development of different varieties is sure to increase their prominence. However, literature on this phenomenon is still not very advanced, and a multitude of questions have yet to be addressed.

The current VI literature has mainly focused on the comparison of HIs vs. VIs (e.g., Ameen, Cheah, Ali, El-Manstrly, & Kulyciute, 2023; Franke et al., 2023; Zhou et al., 2023). These studies compared elements such as endorsement effectiveness (Li et al., 2023), persuasiveness (Yang et al., 2023), or the impact on appearance anxiety (Deng & Jiang, 2023).

While these findings are important for managerial decisions regarding the choice between an HI or a VI, they do not provide answers on the optimal use of VIs. There are only a few existing studies on the comparison of differently designed VIs, and their results are inconclusive. For instance, Kim et al. (2023) find that message credibility is higher for extremely human-like than cartoon-like VIs, but this effect vanishes as soon as there is a sponsorship disclosure. Yang et al. (2023) confirm the higher credibility effect for human-like VIs, but they specifically looked at VIs as endorsers for climate change CSR campaigns. A study by Arsenyan & Mirowska (2021) shows that a human-like VI receives significantly fewer positive reactions than a cartoon-like VI on social media. However, in their case, it was not evident whether users were aware that the VIs were not human. Thus, as a first research gap, we identify the comparison of cartoon-like vs. human-like VIs endorsing brands in commercial advertisements, where the sponsorship and the virtual nature of the influencers are fully disclosed. We also believe that important variables contributing to advertising effectiveness have not yet been considered, such as perceived novelty of the VI.

In a first step (Studies 1a & 1b), we compare the possible advantages of two types of VIs (cartoon-like vs. human-like), considering trustworthiness and novelty as two important factors influencing attitude towards the ad (aad). In doing so, we answer a call from marketing literature to investigate the unique benefits, risks, and mechanisms associated with VI marketing (Miao et al., 2022). Existing literature underscores the pivotal role of influencer trustworthiness in shaping endorsement and advertising effectiveness (Janssen et al., 2022). For example, Schouten et al. (2021) delineated trustworthiness as a mediator between the type of endorser (celebrity vs. influencer) and aad. Additionally, Chekima et al. (2020) identified trustworthiness as a key driver for advertising evaluation. Thus, we believe that focusing on trustworthiness is a valuable approach to determine effectiveness of VIs. Similarly, novelty has been identified as a key driver for aad. Prior studies have found a significant positive relation between novelty, in the sense of divergence from the norm, and aad (e.g., Ang et al., 2007; Sheinin et al., 2011). By examining perceived novelty in the context of VI endorsements, we introduce a relevant variable that has not been investigated thoroughly in the influencer context.

Another aspect that has not yet been addressed in the aforementioned studies is the exploration of the underlying psychological processes that explain the evaluation of VIs. In a second step (Study 2), we elucidate psychological distance (PD) as an explanatory variable for the assessment of influencer trustworthiness or novelty. In doing this, we reply to a request from Schmitt (2020) to determine if human likeness is able to reduce resentment towards new technologies, also referred to as "speciesism," and which psychological processes might cause them. Beyond this, we examine whether the different levels of PD associated with the influencer design, and the consumer reactions triggered can be reinforced by a further moderator (message focus), basing our considerations on construal level theory (CLT).

Finally, we aim to enhance the generalizability and thus the validity of our findings by expanding our research to different cultural contexts, as prior research has suggested that cultural backgrounds can shape consumers' responses to advertising (e.g., Choi et al., 2020; Shin et al., 2022). In particular, variations in the perception of VIs stemming from cultural differences are a research gap requiring attention (Byun & Ahn, 2023). Koles et al. (2024) confirm that culture might have a significant impact on users' VI perception and encourage future studies to investigate whether distinct reactions towards VIs emerge based on the cultural context. Thus, in a third step (Study 3) we take into account that VI familiarity and, consequently, PD towards VIs might vary across countries. More specifically, we investigate whether the perception of VIs differs between Asian and European cultural circles, assuming that the novelty benefit of the cartoon-like VI might vanish as soon as consumers become accustomed to the phenomenon.

This manuscript endeavors to address these gaps by providing an experimental analysis of two distinct types of virtual influencers and their respective impacts on advertising effectiveness, with the goal of deriving managerial insights on optimizing the unique potential of each. Following a quantitative research approach, we conduct four between-subjects experimental studies.

The remainder of this paper is organized as follows: After a brief conceptualization of VIs, we provide a categorization of VI types, discuss their opportunities and risks from different theoretical perspectives (Computers as Social Actors (CASA), CLT), and test our hypotheses in four experimental studies. The paper concludes with a general discussion encompassing theoretical and managerial implications, limitations of the study, and directions for future research avenues.

2. Comparison of different VI types – Literature overview

2.1. Definition of VIs and categorization of VI types

Some scholars refer to VIs as "computer-generated" or "AI-powered" avatars (e.g., Miao et al., 2022; Yang et al., 2023). Although avatars might also be used for brands to provide customer support, in the form of virtual assistants or chatbots (Crolic et al., 2022), they are not commonly engaging in brand endorsements or trying to influence consumers' attitudes. With this distinction, we follow the conceptualization of Mouritzen et al. (2023) and refer to VIs as digitally created characters, often designed to resemble humans, engaging with audiences, and representing brands on the internet (see also Thomas & Fowler, 2021). While we conceive of avatars as a concept similar to VIs, as defined by Miao et al. (2022), our key distinction lies in the intent and audience of each concept. Avatars primarily serve individual users, while VIs are designed to achieve broader marketing or entertainment objectives.

Until now, social media influencers have primarily been human beings, and the emergence of VIs represents a notable transformation in the world of digital influence (Xie-Carson et al., 2023). However, researchers (e.g., Moon & Nass, 1996; Nass & Moon, 2000) make the fundamental assumption that strong similarities exist between human–computer and human–human interaction. In this context, Nass and colleagues (Nass & Moon, 2000; Reeves & Nass, 1996) coined the CASA paradigm, which states that individuals transfer social rules and expectations to communication with computers. Two major explanations for the occurrence of these effects have been discussed in prior CASA literature: mindlessness and anthropomorphism (Lombard & Xu, 2021).

Mindlessness, on the one hand, refers to the idea that people tend to naturally respond to the social cues of technologies, even if they are not explicitly designed to be social (Nass & Moon, 2000). Anthropomorphism, on the other hand, involves attributing human-like characteristics and intentions to non-human agents (Aggarwal & McGill, 2007; Epley et al., 2007). While both mindlessness and anthropomorphism provide plausible explanations for users' social responses to technology, they have both been challenged in previous literature (Lombard & Xu, 2021). Regarding mindlessness, Mou and Xu (2017) discovered that participants exhibited different personality traits and communication attributes when interacting with chatbots compared to humans. Similarly, anthropomorphism may not account for all findings, such as cases where more human-like characters in computer interfaces do not always lead to stronger social responses (Lee, 2010). Therefore, scholars argue that these seemingly contradictory mechanisms can be unified in explaining social responses to media technologies. They suggest that mindless anthropomorphism and mindful anthropomorphism can coexist and depend on the quantity and quality of cues provided by the technology (Gambino et al., 2020; Kim & Sundar, 2012). When technologies exhibit a rich set of social cues (e.g., voice, human-like appearance, emotions), users may engage in mindless anthropomorphism, responding intuitively and spontaneously (Xu et al., 2022). Conversely, when technologies lack sufficient cues, users may engage in mindful anthropomorphism, deliberately (and via conscious cognitive processes) attributing human characteristics to them (Lombard & Xu, 2021; Xu et al., 2022).

When it comes to VIs, there is a lot of variety concerning the amount and quality of the displayed social cues, with some facilitating the occurrence of mindless Mindlessness, on the one hand, refers to the idea that people tend to naturally respond to the social cues of technologies, even if they are not explicitly designed to be social (Nass & Moon, 2000). Anthropomorphism, on the other hand, involves attributing human-like characteristics and intentions to non-human agents (Aggarwal & McGill, 2007; Epley et al., 2007). While both mindlessness and anthropomorphism provide plausible explanations for users' social responses to technology, they have both been challenged in previous literature (Lombard & Xu, 2021). Regarding mindlessness, Mou and Xu (2017) discovered that participants exhibited different personality traits and communication attributes when interacting with chatbots versus humans. Similarly, anthropomorphism may not account for all findings, such as cases where more human-like characters in computer interfaces do not always lead to stronger social responses (Lee, 2010). Therefore, scholars argue that these seemingly contradictory mechanisms can be unified in explaining social responses to media technologies. They suggest that mindless anthropomorphism and mindful anthropomorphism can coexist and depend on the quantity and quality of cues provided by the technology (Gambino et al., 2020; Kim & Sundar, 2012). When technologies exhibit a rich set of social cues (e.g., voice, human-like appearance, emotions), users may engage in mindless anthropomorphism, responding intuitively and spontaneously (Xu et al., 2022). Conversely, when technologies lack sufficient cues, users may engage in mindful anthropomorphism, deliberately (and via conscious cognitive processes) attributing human characteristics to them (Lombard & Xu, 2021; Xu et al., 2022)., intuitive responses and others not taking on a human form. Therefore, it is important to categorize different types of VIs based on their appearance or design. One common way to categorize them is by distinguishing between "animal-like," "cartoon-like," and "human-like" VIs (e.g., Audrezet & Koles, 2023; El Hedhli et al., 2023; Yang et al., 2023). In our studies, we concentrate on those VIs that are designed to resemble human beings and distinguish between stylized cartoonish versions of a human (cartoon-like) VI and those ultra-realistic, almost perfectly human-resembling (human-like) VI. While some categorizations in the literature refer to the less-realistic VI as anime VI, they still describe their anime VI as appearing to be a cartoon character (see Arsenyan & Mirowska, 2021; Kim et al., 2023), hence we stick to the term "cartoon-like".

2.2. Analysis of prior research findings on VIs and virtual character design

While the body of literature on VIs is still emerging, most existing studies focus on the comparison of HIs vs. VIs (Byun & Ahn, 2023). For example, Thomas & Fowler (2021) examined how a politically incorrect statement by a VI or an HI affected the evaluation of the influencer. Their findings indicate that respondents preferred a human replacement for the influencer over a virtual one, as they suspected that the VI might misbehave again in the future. The authors attributed this to the perception among participants that virtual characters were viewed as interchangeable.

Franke et al. (2023) found that consumers have a more positive attitude towards HIs than VIs; however, VIs can score with novelty. When there is a high perceived congruence between VI and the advertised product (e.g., a technical product in contrast to a cosmetic product), VI advertising can be effective. The authors further advise marketers to always disclose the influencer's virtual nature, as influencer uncanniness was higher in the no-disclosure condition. In their interviews with followers, Lou et al. (2022) identified novelty, along with entertainment and aesthetics, as a key motivation for consumers' engagement with VIs.

As these studies provide important results, helping to understand consumer reactions towards VIs, they mainly used human-like VIs for the comparison against HIs. The comparison of different VI types is not yet very advanced. However, there are a few contributions that we will discuss in the following, beginning with qualitative and then quantitative approaches.

Moustakas et al. (2020) tackled the question of choosing the influencer type through expert interviews, ultimately concluding that a definitive assessment is premature. They suggested that both human-like and cartoon-like VIs hold the potential for success. As a result of sentiment analysis, Arsenyan and Mirowska (2021) examined the posting behavior of VI followers and discovered that the human-like VI received more negative comments than the cartoon-like VI. They explain this result by the occurrence of the uncanny valley effect. The uncanny valley effect (Mori, 1970/2012) is a concept suggesting that as a virtual character becomes more human-like in appearance and behavior, individuals' emotional response to it becomes increasingly positive. However, there is a critical point at which the entity is almost but not quite indistinguishable from a real human, and at this stage, the response can quickly turn negative (MacDorman, 2006).

An alternative explanation for the negative responses to the human-like VI might be that consumers were unaware that it was not a real human, as the uncanny valley effect can also be elicited when individuals struggle to ascertain whether an entity is virtual or human (MacDorman & Chattopadhyay, 2016). As the study observed actual follower posting behavior, there was no control over whether respondents knew about the influencer's virtual nature. Thus, it might be possible that respondents thought the human-like VI was a human being but with an artificial appearance (Arsenyan & Mirowska, 2021). To mitigate this risk, in our studies, we clearly indicate that the VIs do not exist in reality and only include respondents who correctly identify this fact. Incidentally, the requirement for labeling is also demanded by consumer protection organizations (see for a discussion Callahan, 2021).

When considering the quantitative results, Yang et al. (2023) found that human-like VIs elicited more trustworthiness, expertise, and attractiveness in comparison to cartoon-like VIs and led to greater CSR engagement. Yang et al. thus recommend using human-like designed VIs. However, it is worth noting that, in Yang et al.'s study, the VIs promoted campaigns related to climate change rather than typical advertising messages. In such cases, the trustworthiness of the messenger becomes even more significant (Yang et al., 2023). Supporting these findings, Kim et al. (2023) observed stronger message credibility for human-like VI endorsements and a more positive attitude towards the message compared to cartoon-like VI endorsements. However, these effects vanish when sponsorship is disclosed. In our studies, we focus on commercial advertisements with a transparent disclosure of the advertising content. See Table 1 for an overview of selected VI studies.

As trust in non-human entities is a complex matter, it is necessary to define the term "trustworthiness" in the context of our studies. Trustworthiness is understood as the extent to which a source is perceived to be honest, reliable, and dependable, following Ohanian's (1990) framework. This understanding of trustworthiness is a fundamental concept utilized in various research studies examining the effectiveness of social media influencers, such as those conducted by Chekima et al. (2020), Jin et al. (2019), and Wiedmann & von Mettenheim (2020).

Trust is a concept that originates from human-to-human interaction (Liu, 2021). However, the CASA paradigm mentioned above contends that both human-to-human trust and human-to-computer trust are governed by the same underlying principles (Rheu et al., 2021). Thus, we readily apply trustworthiness to VIs, as has also been demonstrated by recent literature on VI effectiveness; see, for example, Liu & Lee (2022) or Yang et al. (2023).

As VI literature does not yet offer sufficient comprehensive findings, we additionally draw from research on the related concept of avatars. There, on the one hand, studies recommend less-realistic images. For instance, Schwind et al. (2018, p. 45) suggest adding conspicuous features (e.g., a snub nose) to virtual characters because "humans readily accept unrealistic characters when they are consistently unrealistic, as

Table 1
Selected studies from VI literature.

Publication	Method	Main results
Comparison HI vs. VI		
Byun & Ahn (2023)	Systematic literature review	While there are numerous similarities between HIs and VIs as advertising endorsers, there are also significant differences playing a crucial role in defining the limitations and potentials of VIs in interactive advertising.
Thomas & Fowler (2021)	Experimental research	HIs and VIs can build similar positive brand benefits, but in case of a transgression, consumers prefer a human replacement for the VI, as they suspect the VI to behave negatively again. This is because VIs are perceived as interchangeable, whereas HIs are more unique.
Franke et al. (2023)	Experimental research	Consumers have a more positive attitude towards HIs than VIs; however, VIs can score with novelty. Further, endorsement effectiveness depends on compatibility with product category (e.g. technical products are more compatible with a VI than cosmetic products).
Lou et al. (2022)	Qualitative, in-depth interviews	Identification of six primary motivations for consumers to follow virtual influencers on social media: novelty, information, entertainment, surveillance, esthetics, integration, and social interaction.
Li et al. (2023)	Experimental research	HIs outperform VIs with regard to brand attitude and purchase intention. This is attributed to perceived sensory capability and credibility as mediating factors. Low salience of sensory cues within ads can mitigate the negative impact of VIs.
Comparison HVI vs. CVI*		
Moustakas et al. (2020)	Qualitative, expert interviews	Discovering advantages (e.g., attraction of younger audience, novelty) and disadvantages (e.g., lack of authenticity) of using VIs as marketing strategy. Not clear, if HVI or CVI more promising, both have potential for success.
Arsenyan & Mirowska (2021)	Data scraping from influencer posts and comments	HVI elicits noticeably reduced positive reactions than the CVI, indicating support for the Uncanny Valley phenomenon.
Yang et al. (2023)	Experimental research	HVI generates higher trustworthiness, expertise, and attractiveness in comparison to CVI, in turn leading to greater CSR engagement.
Kim et al. (2023)	Experimental research	HVI endorsements generate stronger message credibility and more favorable attitudes towards the message compared to CVI endorsements. However, these effects are diminished when sponsorship is revealed.
This article	Experimental research	HVIs are perceived as more trustworthy, while CVIs can score with novelty. PD is higher for the CVI than the HVI and is the underlying mechanism between VI evaluation and aad. The beneficial novelty effect of the CVI is restricted to consumer groups low in VI familiarity.

*HVI=human-like virtual influencer, CVI=cartoon-like virtual influencer.

frequently seen in cartoons." There is also evidence of negative reactions elicited by excessive human likeness. Rosenthal-von der Pütten et al. (2019) confirmed the above-mentioned uncanny valley effect in a fMRI experiment, in which the human resemblance of virtual characters was systematically varied. Significant changes in brain activity were observed when looking at more- or less-human-like figures, indicating when the precipice of the uncanny valley had been approached.

On the other hand, avatar studies find positive correlations between a high degree of visual realism and avatar evaluation in terms of attractiveness or liking (e.g., Mull et al., 2015). Seymour et al. (2021) show that respondents rate a photo-realistic avatar as more trustworthy than a cartoon-like one. The authors note that individuals are evolutionarily conditioned to interpret human faces allowing them to swiftly recognize and dismiss virtual faces that are only approximately realistic. Qiu and Benbasat (2009) also confirm this close link between a human-like design and perceptions of trustworthiness. Trustworthiness is crucial for virtual characters, especially vis-à-vis the uncanny valley effect. When assessing the trustworthiness of human and non-human faces, individuals find it more difficult to assess animated or cartoon-like faces as opposed to photo-realistic ones (Machneva et al., 2022). The perception of the trustworthiness of an endorser in turn can influence advertising effectiveness (Amos et al., 2008). We follow this line of argumentation and hypothesize:

> **H1**: A human-like virtual influencer will generate a higher perception of trustworthiness than a cartoon-like virtual influencer (a). Trustworthiness in turn increases attitude towards the ad (b).

However, we also anticipate that the ultra-realistic appearance of the human-like virtual influencer hinders it from truly standing out from the advertising flood. An animated character, advertising fashionable products, not real but drawn in human likeness, might represent a greater deviation from what consumers are accustomed to. According to Berlyne's (1970) theory, all collative, affective, or intense stimuli are capable of evoking arousal. Collative stimuli are surprising, unexpected, or outstanding and influence arousal levels via the attentional process. Novelty as one of the most important collative properties is defined as the degree of divergence between an experienced stimulus and previously experienced stimuli (Berlyne, 1967). In an advertising context, a novel stimulus is understood as new or exciting and encompassing unusual content or design compared to other advertising (Eisend, 2007; Yim et al., 2013). Such deviations from well-known stimuli in the environment are more likely to attract consumers' attention and can lead to a positive appraisal (Schoormans & Robben, 1997; see also Chu et al., 2016). Yang et al. (2020) compared video advertisements that used novel technology (AR) in the video with advertisements that did not, and found that the use of the technology increased aad by enhancing curiosity. Moreover, Sheinin et al. (2011) found that novelty is able to positively influence aad. This relation between novelty and aad could also be observed by Ang & Low (2000) and Ang et al. (2007).

Taking these findings from the literature into account, we propose that the utilization of virtual endorsers, crafted on a computer but nonetheless promoting real-life products, can be deemed novel. Especially when promoting beauty or lifestyle products, marketers usually rely on consistently flawless yet generic faces. Therefore, the incorporation of VIs serves as a means of differentiation. However, we believe that as the human-like VI strongly resembles a "normal" human endorser, a cartoon-like, clearly animated character will diverge more strongly from previously experienced ad stimuli. We hypothesize:

> **H2**: A cartoon-like virtual influencer will generate a higher perception of novelty than a human-like virtual influencer (a). Novelty in turn increases attitude towards the ad (b).

2.3. Empirical Study 1a

2.3.1. Pretest

In a pretest (N=69, M_{age} = 36.32, ± = 14.51), we confronted respondents with one of two existing VIs (Lil Miquela or Noonoouri), representing different degrees of human likeness. We informed the participants in a brief explanation that the influencers were created via software and do not exist in real life, as we did in all further studies. Both influencer types received the fictive name Emily Woods (also throughout all studies). Human likeness (α = 0.856) was measured with three items (not very human-like – very human-like; not very cartoon-like – very cartoon-like; not very realistic – very realistic) (Nowak & Rauh, 2005). The pretest showed that the influencers were perceived differently regarding human likeness, with higher ratings for the human-like VI (M_{HVI}=4.21 vs. M_{CVI}=2.39, t(67) = 5.88, p < 0.001), indicating that the manipulation of the independent variable was successful.

2.3.2. Method main study

Design and procedure. Study 1a featured a one-factorial (type of VI: cartoon-like vs. human-like) between-subjects design. First, respondents received the same brief explanation about the virtual nature of the influencer as in the pretest. Then they were randomly exposed to an advertisement showing either one of the two influencers promoting an attractiveness-relevant lifestyle product. We decided to use a perfume: CK One by Calvin Klein, which is very well known and described as a "fragrance for every day." We chose this perfume since VIs are predominantly found in the fashion and cosmetics domain (Naumann & Daubenbuechel, 2021), and it is a so-called unisex perfume so suitable for both men and women. This enables both men and women to be interviewed about an advertising campaign that we tried to create in a realistic manner (see Fig. 1). The respondents evaluated the influencer (human likeness, novelty, trustworthiness), their aad, and control variables (brand attitude, product involvement). Lastly, they were asked to indicate if the influencer was either human (=existing in real life) or virtual (=created on a computer), to control whether respondents understood the assignment. After completing the sociodemographic data, participants were thanked for their participation and given a contact email address in case they had questions or wanted to inquire about the survey's purpose or results.

Sample. We collected data on N=153 respondents in an online interview administered through Qualtrics. We recruited respondents through 15 students enrolled in a university master's course in market research. Each recruiter was tasked with enlisting a minimum of six respondents, with the option to gather more, and was specifically instructed not to reveal the purpose of the study to respondents beforehand. The online survey was distributed by the recruiters through email or social media channels. In appreciation of their assistance, the recruiters were awarded course credits. We excluded respondents who thought the influencer was a human being (n = 4), resulting in a final sample of n = 149 (M_{age} = 30.66 ± 12.64). We then checked for demographic differences between the experimental groups based on unpaired t-tests for continuous variables and chi-square tests for categorical variables. We did not find differences in the distribution of gender, age, income, and education (ps > 0.393). The groups further showed no significant differences with regard to our control variables, brand attitude, and product involvement (ps > 0.234). We also checked whether male and female respondents reacted differently towards the stimuli by conducting two-factorial ANOVAs with gender and VI type as independent variables, and trustworthiness, novelty, and aad as dependent variables, but did not find significant main effects of gender or interaction effects (ps > 0.289).

Measures. Human likeness was measured as in the pretest (α = 0.893). We measured trustworthiness (e.g., not trustworthy – trustworthy, α = 0.949) with five items from a source credibility model (Ohanian, 1990). Novelty was measured with three items (e.g., predictable – novel, α = 0.816) adopted from Andrews and Smith (1996), and aad ratings were obtained with four items (e.g., not pleasant – pleasant, α = 0.900) adopted from Silvera & Austad (2004). All constructs in our studies were measured on 7-point scales. A factor analysis demonstrates discriminant validity whereby the items on human likeness, trustworthiness, novelty, and aad load as expected on four different factors.

2.3.3. Results main study

Manipulation check. The manipulation check yielded similar results as the pretest, showing higher human-likeness ratings for the human-like VI than the cartoon-like VI (M_{HVI}=4.13 vs. M_{CVI}=2.35, t(147) = 8.14, p < 0.001). Thus, the manipulation of our independent variable was successful.

Hypotheses testing. H1 and H2 underwent testing through parallel using Hayes' (2018) Process (v.4.0, model 4). The human-like VI led to a significant increase in trustworthiness (b = 0.591, p = 0.007; M_{HVI}=3.91 vs. M_{CVI}=3.32), but a decrease in novelty (b = -0.701, p < 0.001; M_{HVI}=3.94 vs. M_{CVI}=4.64). Trustworthiness (b = 0.668, p < 0.001) and novelty (b = 0.281, p < 0.001) both exerted a positive influence on aad. The indirect effect of influencer type over trustworthiness on aad was significant, b = 0.395, 95 % CI[0.110; 0.705]. Similarly, the indirect effect of VI type over novelty on aad, b = -0.197, 95 % CI[-0.355; −0.058] was significant. Thus, H1 and H2 (a and b) were supported; see Fig. 2 for a visualization of the mediation analysis. Additionally, the mean values of the mediators and the dependent variables are presented in Fig. 3. In summary, aad induced by cartoon- vs. human-like VIs is mediated by different constructs. However, there was also a direct effect of VI type on aad: the human-like influencer generated higher aad (b = 0.763, p < 0.001; M_{HVI}=4.28 vs. M_{CVI}=3.32).

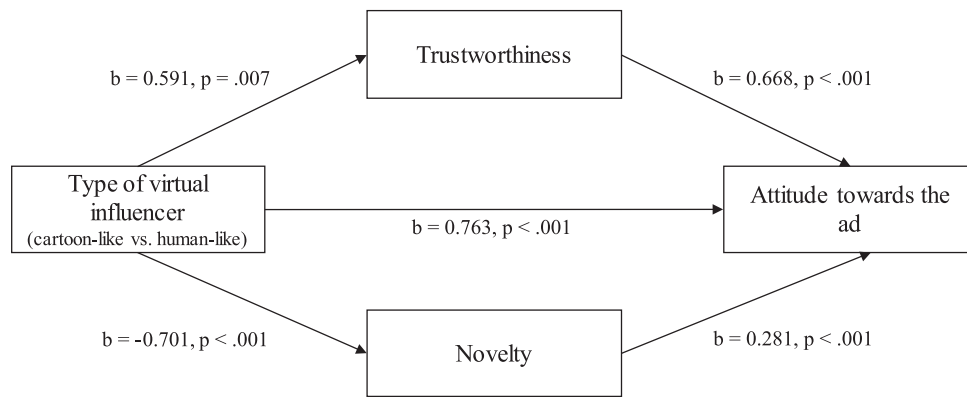**Fig. 1.** Stimuli used in Study 1a.

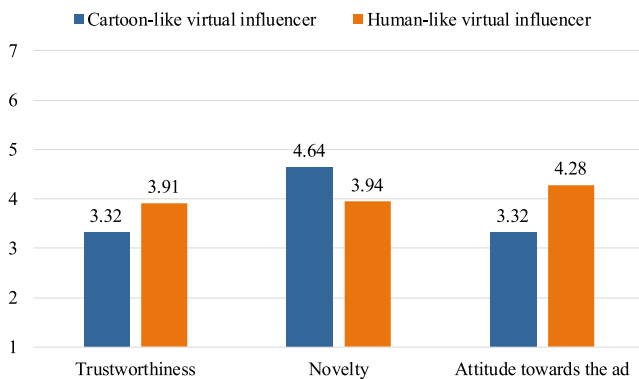**Fig. 2.** Results mediation analysis in Study 1a.

Fig. 3. Mean values influencer and ad evaluation in Study 1a.

2.4. Empirical Study 1b

While the primary strength of Study 1a lies in its realistic design, achieved by utilizing existing influencers, there is an issue related to the distinct external appearances of the influencers. To address and resolve this limitation, we conducted a follow-up study in which we selected a single VI and modified its image (via a Snapchat filter) to give it a cartoon-like appearance.

2.4.1. Method

Design and procedure. The design and procedure of Study 1b were the same as in Study 1a. Again, respondents received the explanation about the influencer being virtual and not existing in real life and were then confronted with a VI advertising perfume (again CK One). However, this time, instead of using two different VIs, we used the same influencer and

altered its face with a cartoon filter. Again she was given the fictive name Emily Woods. We chose an image with the influencer's face in close-up to ensure that the cartoon filter would give a satisfactory result (see Fig. 4 for the stimuli). After seeing the ad, participants received the same questions in identical chronology as in Study 1a. Again, they were debriefed and thanked for their participation.

Sample and measures. For Study 1b we assigned an online market research institute to recruit respondents. For their participation in the questionnaire, which was again administered in Qualtrics, respondents received monetary compensation which was issued by the market research institute.

A total of 110 respondents were acquired, from which we excluded $n = 12$ respondents because they falsely indicated that the influencer in the ad was a real human being, resulting in a remaining sample of $n = 98$ ($M_{age} = 48.63 \pm 16.08$). The two groups again did not differ regarding socio-economic variables, brand attitude, and product involvement ($ps > 0.157$). Here, too, we conducted two-factorial ANOVAs to check for gender differences but did not find main effects of gender nor interaction effects with regard to the responses to the stimuli ($ps > 0.206$). We also used the same measures as in Study 1a.

2.4.2. Results

Manipulation check. As expected, the unaltered version of the VI was rated more human-like than the cartoonized version ($M_{HVI}=4.31$ vs. $M_{CVI}=3.20$, $t(96) = 3.440$, $p < 0.001$).

Hypotheses testing. The parallel mediation yielded the same results as before, as the human-like VI enhanced trustworthiness ($b = 0.631$, $p = 0.025$; $M_{HVI}=4.96$ vs. $M_{CVI}=4.32$) but decreased novelty ($b = -0.678$, $p = 0.038$; $M_{HVI}=4.26$ vs. $M_{CVI}=4.94$). As before, trustworthiness ($b = 0.555$, $p < 0.001$) and novelty ($b = 0.456$, $p < 0.001$) both positively influence aad ($M_{HVI}=4.88$ vs. $M_{CVI}=4.57$). The indirect effect of influencer type over trustworthiness on aad was again significant, $b = 0.350$,
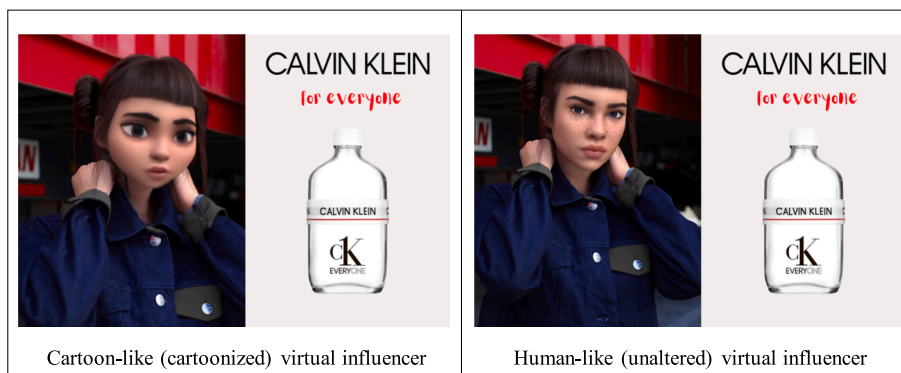

Cartoon-like (cartoonized) virtual influencer   Human-like (unaltered) virtual influencer

Fig. 4. Stimuli used in Study 1b.

95 % CI[0.044; 0.693]. The same was true for the indirect effect over novelty on aad, b = -0.309, 95 % CI[-0.650; −0.028]. Thus, we could replicate the results from Study 1a when using the exact same influencer picture altered with a cartoon filter (see mediation results in Fig. 5). The mean values for the mediators and dependent variables are again displayed (see Fig. 6).

2.5. Discussion studies 1a & b

Our results from Studies 1a & b show that a human-like VI is evaluated as significantly more trustworthy compared to a cartoon-like VI. However, as for novelty, the cartoon-like one was superior. Trustworthiness and novelty both strengthen ad effectiveness in terms of attitude towards the ad. Hence, our study corroborates recent findings by Kim et al. (2023) or Yang et al. (2023), particularly when sponsorship disclosure is ensured within an advertising context. Additionally, we contribute to the VI endorsement literature by introducing novelty as a potentially attitude-enhancing concept.

Study 1a used VIs that differed in visual appearance (look, general style), but had already been featured in advertising, providing a high level of external validity. Study 1b was conducted to ensure internal validity and to replicate the results when the same influencer was used while varying only the degree of human-likeness. Studies 1a & b show that both types of VIs have specific benefits that can increase advertising effectiveness, which makes them interesting for brand communication. In a next step it needs to be refined under which conditions these benefits are best realized. Finding a direct effect from VI type on aad in Study 1a implies that further explanatory variables should be considered. Therefore, in Study 2 we aim to seek the underlying psychological process that drives trustworthiness and novelty perception. We predict that the level of perceived similarity is different for both VI types resulting in a higher PD (social dimension) towards the cartoon-like VI. PD in turn might be the driver for both effects, trustworthiness and novelty. In addition, we examine the moderating role of construal which may strengthen or weaken the proposed effects.

3. Study 2: The role of message focus and construal level

3.1. Theoretical background and hypotheses

The similarity-attraction effect (Montoya et al., 2008; Singh, 1974) explains that the higher the perceived similarity to an object or person, the higher its attractiveness. The effect is not limited to human–human interpersonal relations but also applies to virtual characters (Moon & Nass, 1998). In past research, for instance, Moon and Nass (1996) showed that subjects were more attracted to computers that displayed similar (fictive) personality characteristics (dominant vs. submissive) than dissimilar ones. Similar voices or habits of robots were also preferred (Bernier & Scassellati, 2010; Nass & Lee, 2001). Choosing an
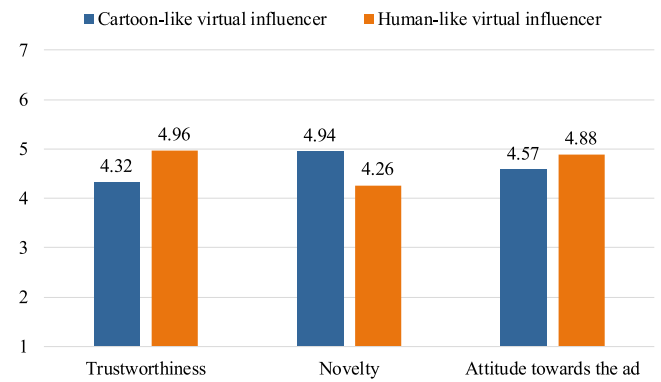

Fig. 6. Mean values influencer and ad evaluation in Study 1b.

avatar that closely resembles its user leads to a greater sense of identification with the avatar and a higher likelihood of having positive attitudes towards it (Suh et al., 2011). Literature in social psychology also shows that perceived interpersonal similarity affects social distance: More specifically, the assumption is that similarity can be considered as a form of social distance (Liviatan et al., 2008). This is reflected in the operationalization of closeness as similarity to others, e.g., in terms of age, gender, or personality traits (see Liviatan et al., 2008). Social distance, along with temporal, spatial, and hypothetical distance, is one of the dimensions of PD, which generally refers to the subjective experience that someone or something is close to or distant from the self (Trope & Liberman, 2010). For example, individuals perceive higher PD towards events in the distant future than in the near future (temporal: one year vs. one week), when the physical distance between an individual and a target is high vs. low (spatial: 100 miles vs. 1 mile), or towards strangers compared to close friends (social). Entities similar to oneself are perceived as socially closer than dissimilar ones because the feeling of distance is reduced (Trope et al., 2007). Studies on the selection process of avatars have shown that human-like avatars were reported as more representative of one's physical self than less realistic avatars (Nowak, 2013). We thus assume that the lower visual resemblance of the cartoon-like VI will be responsible for an increase in PD, and hypothesize:

H3: The cartoon-like virtual influencer will trigger a higher psychological distance (social dimension) than the human-like virtual influencer.

Similarity not only has a positive effect on social attraction but can also diminish the degree of uncertainty of information seekers. When there is similarity between two individuals, feelings of discomfort and uncertainty should be reduced (Kunz & Seshadri, 2015). Antheunis et al. (2010) confirm that individuals use similarity as an uncertainty
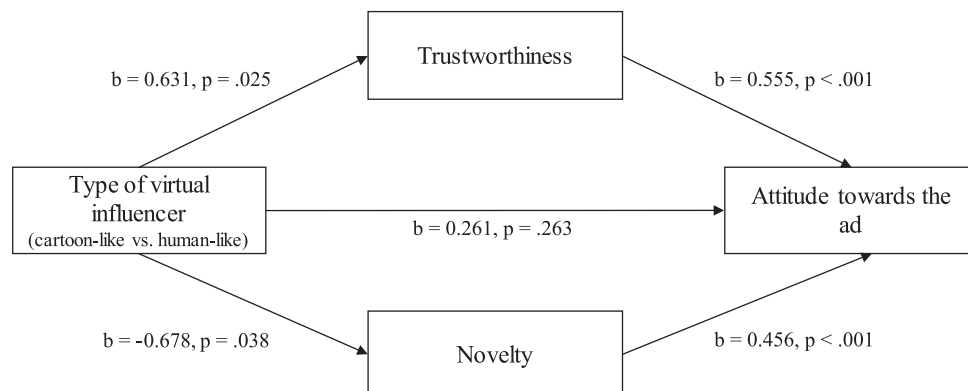

Fig. 5. Results mediation analysis in Study 1b.

reduction strategy when making new acquaintances online. In the same sense, Racherla et al. (2012) demonstrated that consumers consider social cues, such as perceived background similarity between the reviewer and the reader, when assessing online reviews, and these similarities can enhance trust in the review. This is because the lower the perceived PD, the more available and reliable the corresponding information appears (Trope et al., 2007). In this regard, Edwards et al. (2009) could show that geographical proximity created by a similar physical location to an unknown retailer could improve the retailer trustworthiness. Also, reducing PD from a retailer by providing additional information on the owner's name and appearance increased trustworthiness of the retailer (Darke et al., 2016). By equipping an AI agent with a voice that was similar in pitch and timbre to the voice of its user, the AI agent's recommendations were more likely to be followed because it was perceived as more trustworthy (Lowe & Hyun, 2020). Therefore, we assume:

H4: The higher the psychological distance, the lower influencer trustworthiness will be evaluated (a). Trustworthiness will positively influence attitude towards the ad (b).

In the same sense, we assume that social distance might influence novelty perception. Trope and Liberman (2010) propose a relationship between distance and novelty: Because novel objects or events are unfamiliar, they may be perceived as more distant. Förster et al. (2009) showed that participants display a shift towards a more abstract processing style of a given stimulus when preparing for a novel event, compared to local or detailed processing when preparing for a familiar event. While they examined the influence of tasks or events framed as novel vs. familiar on the processing style of consumers, we focus on the influence of distance (in terms of visual dissimilarity) on the perception of novelty, assuming that a higher PD triggers the feeling of novelty. For this assumption, we draw from different fields of literature: Individuals who want to differentiate from others and prove their uniqueness crave products that are new and mostly dissimilar to commonly used products (Simonson & Nowlis, 2000). Highlighting dissimilarities between a parent brand and its extension facilitates novelty perception of the extension (Estes et al., 2012). In tourism marketing, destination countries can be arranged on a continuum from familiarity to novelty, depending on the cultural distance (Huang et al., 2013). Tourists in search of novelty are more likely to consider culturally distant destinations (Liu et al., 2018). Viewing objects through immersive virtual reality (vs. non-immersive VR) increased perceived novelty of the technology and thus user satisfaction, but only when the object was shown at a greater distance (high PD) (Talukdar & Yu, 2021). Thus, we assume:

H5: The higher the psychological distance, the higher novelty will be evaluated (a). Novelty will positively influence attitude towards the ad (b).

Furthermore, we assume that the either high or low PD triggered by VI type and its effects on novelty and trustworthiness can be amplified by corresponding information congruent to the perceived distance. CLT proposes that a low PD goes along with a low level of abstraction. This means that thoughts are very detailed, specific, concrete, and concerned with the "how." By contrast, a high PD goes along with high-level abstraction that stresses more global, central, or abstract features, focusing on the "why" (Trope & Liberman, 2010). In other words, CLT assumes an interplay between PD and construal level, in the sense that individuals use low-level construals for psychologically near targets, while distant targets are construed on a high level (Trope et al., 2007). Therefore, when PD is small, people conceive something (e.g., going on vacation the following day) in a more concrete and detailed manner (e. g., How can I organize the journey?), whereas when PD is large (vacation next year), considerations are more abstract and general (e.g., Why is a vacation meaningful?) (Williams et al., 2014).

CLT has also been tested in the context of advertising (see, for

example, Park & Morton, 2015; Septianto et al., 2022; Theodorakis & Painesis, 2018). Here, relevant studies focus on either desirability or feasibility aspects of the advertising message: While desirability means referring to the value of an end state (*Why* a product should be used), feasibility aspects focus on the ease or difficulty of attaining the end state (*How* a product should be used) (Liberman & Trope, 1998). With an abstract mindset or a high level of construal, a person tends to identify desirable properties before feasible ones; with a concrete mindset, he or she focuses more on feasibility information (Liberman et al., 2002). Thus, the importance of desirability considerations increases with greater distance, whereas the importance of feasibility considerations decreases (Eyal et al., 2004). Kim et al. (2016) found that Facebook users sense a higher PD towards their news feed than their timeline. This is because the news feed is an accessible space where different groups of users (acquaintances, friends, brands, etc.) connect, whereas the timeline is most often only visited by close friends or family. Individuals presented with the news feed page (high PD) reacted more positively to abstractly framed desirability-focused advertising, whereas individuals confronted with the timeline page responded more favorably to the feasibility-focused advertising appeal. With this in mind, we assume message focus to be a moderator in the sense that a feasibility-focused appeal will weaken the negative effect of high PD on trustworthiness, whereas a desirability-focused appeal will emphasize the positive effect of high PD on novelty:

H6a: The negative indirect effect of psychological distance via trustworthiness on attitude towards the ad evoked by cartoon- (vs. human-)like virtual influencers is weaker for a message focusing on feasibility.

H6b: The positive indirect effect of psychological distance via novelty on attitude towards the ad evoked by cartoon- (vs. human-)like virtual influencers is stronger for a message focusing on desirability.

3.2. Empirical Study 2

3.2.1. Pretest

In a pretest ($n = 28$, $M_{age} = 30.58 \pm 9.44$), we confronted participants with an advertisement for another lifestyle product. This time, we chose a product where it is plausible to add a description on feasibility or desirability-focused features (Samsung fitness watch). The advertisements in the pretest only featured the fitness watch and the description, without a VI. The description consisted of three statements on either how the product should be used or why the product should be used. For the how framing, we used the statements, "Connect your smartphone via Bluetooth with the Galaxy watch," "Wear the watch on your wrist while you train," "Finish your workout and monitor your fitness data." The why framing read as follows: "Motivate yourself and train like a professional," "Improve your performance and achieve ambitious training goals," "Optimize your fitness and your health." When formulating the description, we followed prior research on message framing and construal level and real-life product descriptions of fitness watches. We also ensured that the number of words did not differ significantly between the two descriptions in order to avoid effects based on reading duration (Words$_{how}$ = 26, Words$_{why}$ = 21). Message focus was measured with items adapted from Ryoo et al. (2017). We employed three items to assess feasibility-focus (e.g., "The ad focused on how the watch works," $\alpha = 0.953$) and three items to map desirability-focus (e.g., "The ad focused on the potential benefits of the watch," $\alpha = 0.936$). This showed that the how-framed description scored higher on feasibility-focus ($M_{feasibility} = 5.47$ vs. $M_{desirability} = 2.33$, $t(26) = 7.025$, $p < 0.001$), while the why-framed description was rated higher on desirability-focus ($M_{feasibility} = 3.14$ vs. $M_{desirability} = 6.06$, $t(26) = -8.469$, $p < 0.001$).

3.2.2. Method main study

Design and procedure. In Study 2, we employed a 2 (type of VI: cartoon-like vs. human-like) $\times$ 2 (message focus: feasibility vs.

desirability) between-subjects design. Our stimuli showed the same influencers used in Study 1a (to ensure a realistic ad scenario) promoting the Samsung fitness watch from the pretest with the inclusion of the product description (see Fig. 7). After the initial briefing to participants that they would be exposed to VI advertising, which means that the influencer does not exist in reality but has been computer-generated, they were asked first to indicate whether the product description was feasibility- or desirability-focused (same items as in the pretest), and then received the influencer and ad-related questions. In the end, they were asked to again indicate whether the influencer was human or virtual. Additionally, the question as to whether respondents recognized the VI was included. Afterwards, they were thanked and provided with the email address to contact the researchers.

Sample. Our participants were again recruited through students enrolled in a university master's program in market research. This time 20 students were tasked with the recruitment of at least six participants. They received the same instructions as in Study 1a for distributing the Qualtrics online survey. A total of N=221 respondents answered the questionnaire. We excluded ($n = 9$) respondents who falsely indicated the influencer was a human being, resulting in a sample to be analyzed of $n = 212$ ($M_{age} = 28.27 \pm 9.10$). Only six respondents stated that they recognized the influencer and were retained in the sample. Again, we could not observe gender-related differences concerning the dependent variables ($ps > 0.297$), and the groups did not differ regarding socio-economic variables, brand attitude, and product involvement ($ps > 0.357$).

Measures. We used three items from Kim et al. (2008) to measure the social distance from the influencer (e.g., distant – close, $\alpha = 0.910$). We measured trustworthiness, novelty, and aad as in Studies 1a and b.

3.2.3. Results

Manipulation checks. The manipulation check reaffirmed the pretest findings, demonstrating that the how description remained feasibility-focused ($M_{feasibility} = 5.38$ vs. $M_{desirability} = 3.54$, $t(210) = 10.489$, $p < 0.001$), while the why description emphasized desirability ($M_{feasibility} = 2.12$ vs. $M_{desirability} = 4.26$, $t(210) = -9.087$, $p < 0.001$). Additionally, a pretest and the manipulation check in the main study showed higher human likeness ratings for the human-like VI (MC: M_{HVI}=4.08 vs. M_{CVI}=2.24, $t(176.93) = 11.398$, $p < 0.001$).

Hypotheses testing. We tested H3 – H6a and b via two separate moderated serial mediations (Process, model 91), with VI type as independent variable, PD as primary mediator, trustworthiness (novelty) as secondary mediators, and aad as dependent variable. PD was higher for the cartoon-like than the human-like VI ($b = 1.236$, $p < 0.001$; M_{HVI}=4.40 vs. M_{CVI}=5.63). The higher the PD, the more negative the evaluation of trustworthiness ($b = -0.364$, $p < 0.001$; M_{HVI}=4.18 vs. M_{CVI}=3.37). Trustworthiness consecutively increased aad ($b = 0.373$, p

< 0.001; M_{HVI}=4.11 vs. M_{CVI}=3.74). The indirect effect of influencer type over PD and trustworthiness on aad was significant in the feasibility condition ($b = 0.186$, 95 % CI[0.075; -0.337] and the desirability condition ($b = 0.152$, 95 % CI [0.052; 0.284]), but we did not find the proposed interaction effect ($b = 0.073$, $p = 0.539$); the indirect effects did not differ depending on the level of the moderator (index of moderated mediation: $b = -0.034$, 95 % CI[-0.158; 0.075]). There was no direct effect of VI type on aad ($b = -0.315$, $p = 0.110$). We calculated again with novelty as secondary mediator. As predicted, the higher the PD, the higher the perception of novelty ($b = 0.205$, $p = 0.041$; M_{HVI}=3.35 vs. M_{CVI}=4.27), and novelty in turn increased aad ($b = 0.173$, $p = 0.002$). This time, we also found the proposed interaction effect ($b = 0.436$, $p = 0.013$). The indirect effect of VI type over PD and novelty on aad was significantly higher in the desirability condition ($b = -0.087$, 95 % CI[-0.182; -0.022]) than in the feasibility condition ($b = 0.006$, 95 % CI[-0.062; 0.086]). The difference between the conditional indirect effects was significant ($b = -0.093$, 95 % CI[-0.010, -0.217]). Again, there was no direct effect of VI type on aad ($b = -0.066$, $p = 0.746$). To summarize, we can accept H3, H4a and b, H5a and b and H6b, but must reject H6a. The results of the moderated mediation analyses are shown in Fig. 8, followed by the means for all constructs presented in Fig. 9.

3.3. Discussion Study 2

In line with our expectations, Study 2 showed that individuals feel more psychologically distant from cartoon-like than human-like VIs. Further, PD proves to be the underlying mechanism influencing the perception of trustworthiness and novelty of the influencers. It also shows that message focus on desirability moderates the relationship of PD with novelty by enhancing the positive effect. Thus, with Study 2 we found a way to highlight the novelty benefit of the cartoon-like VI. However, we did not find this moderating effect for the feasibility message. We observed a highly significant difference in PD between the cartoon-like and human-like VIs, but the human-like influencer was not really "close" – with a mean value of 4.40. The effect might be obtained if we were to compare the cartoon-like VI to an actual human being, as humans are naturally perceived as socially closer than virtual characters (Ahn et al., 2021).

Up to this point, we have solely focused on European respondents, overlooking potential variations related to cultural settings in the evaluation of virtual characters. Given the deeper cultural embedding of anime and cartoon characters in Asian countries (Miyake, 2022), we anticipate that perceptions of cartoon-like VIs may differ compared to European countries. Novelty, particularly in the context of new technologies, may diminish over time as consumers become more accustomed. We are exploring the impact on the novelty effect when
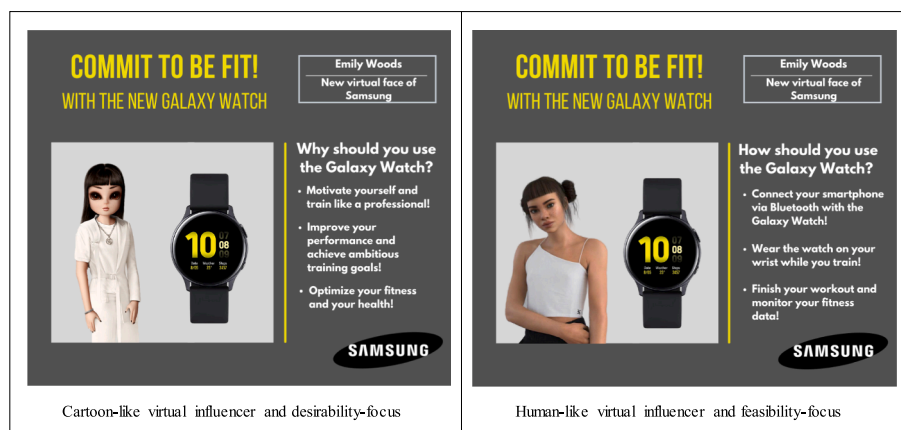

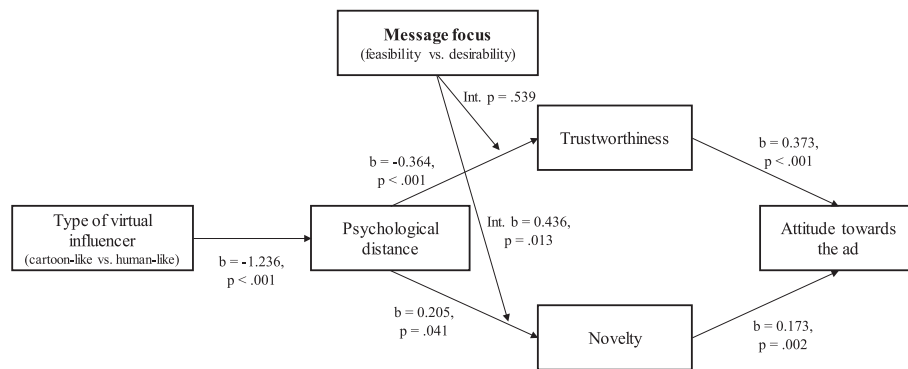
Fig. 7. Stimuli used in Study 2.

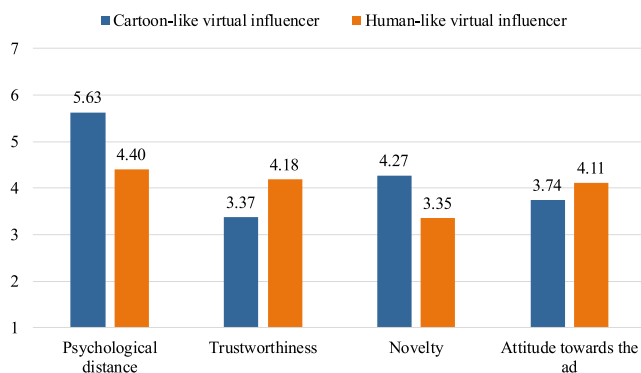**Fig. 8.** Results moderated mediation analyses in Study 2.

Fig. 9. Mean values influencer and ad evaluation in Study 2.

comparing two societies with varying levels of familiarity with VIs, aiming to critically assess the suggested implication that cartoon-like influencers are optimal for eliciting novelty.

4. Theoretical framework Study 3

4.1. Theoretical background and hypothesis

It is well known that the cultural background of a consumer influences his or her attitudes and overall consumption behavior (Maheswaran & Shavitt, 2000), making it crucial to consider different cultural settings and address them adequately, particularly since brands using VIs are almost exclusively those that operate globally and want to reach consumers in different countries. We assume that the most pronounced differences concerning VI acceptance occur between Asian and European societies. Asian countries have a strong fondness for cartoon-like characters owing to their long history of anime and manga culture, which has been ingrained into their daily lives for generations (Wang, 2016). For example, virtual idols, which originated from cartoon characters, have been adored in Asian cultural circles since the 1990 s (Conti et al., 2022). Another rather famous example is the anthropomorphized version of a synthesizer voice ("vocaloid") Hatsune Miku, which records its own music and even performs alongside real-life celebrities (Miyake, 2022). Over the past decade, the Asian virtual idol industry has witnessed remarkable growth. Tech companies have been consistently creating a growing number of 3D celebrities to cater to the primary audience, individuals deeply immersed in the culture of anime, comics, and video games (Lu, 2021; Zhangyu, 2021).

Lou et al. (2022), identifying reasons for following VIs on social media, gathered that VIs are able to represent parts of Asian culture that are popular with consumers. They found, through interviews with Chinese and Malaysian consumers, that a preexisting interest in anime culture predicts a higher motivation to follow a VI.

We thus assume that consumers from societies that are already habituated to (cartoon-like) VIs, and thus perceive less PD, will not experience the novelty effect issued by the cartoon-like VI, as opposed to consumers from societies not familiar with VIs. We hypothesize:

H7: A cartoon-like virtual influencer will generate higher novelty perception than a human-like influencer, but only in societies with low virtual influencer familiarity (respectively high PD). Novelty in turn increases attitude towards the ad.

4.2. Empirical Study 3

4.2.1. Method

Design and procedure. In Study 3, we again employed a 2 (type of VI: human-like vs. cartoon-like) × 2 (cultural setting: Europe vs. Asia) between-subjects design. This time, consumers were confronted with an advertisement for a well-known fashion brand available all over the world (Adidas). As the advertised product, we chose a relatively neutral black hoodie, which could be worn by both men and women. Since we surveyed European as well as Asian consumers this time, we made sure we chose a VI that meets beauty expectations for both cultures. As in Study 1b, we used a filter to cartoonize the VI's face to obtain the cartoon-like version (see Fig. 10). Respondents received the same sequence of influencer and ad-related questions as in the previous studies. In the end, they were asked to again indicate whether the influencer was human or virtual and if they recognized the influencer. Again they were thanked for their participation and invited to contact the researchers in case of inquiries about the survey.

Sample and measures. Data was collected from European ($n = 140$) and Hong Kong ($n = 92$) respondents. Hong Kong was chosen as a representative of Asian culture, well known as a tech-savvy town where English serves as one of the official languages. An international market research institute distributed the online questionnaire to English-speaking Hongkongers. We excluded respondents who thought the influencer was human ($n = 67$), resulting in a remaining sample of $n = 165$ ($M_{age} = 47.13$; ± 15.07). This time, five respondents indicated recognition of the influencer and again were retained in the sample. We measured familiarity with VIs with the single item, "I am familiar with virtual influencers." Human likeness, PD, and novelty were measured as in the previous studies. Also, here, we could not observe significant gender-related differences concerning influencer and ad evaluation ($ps > 0.09$). However, since the effect narrowly missed the 5 % threshold, we had a closer look and found that male respondents had a slightly more favorable aad than female respondents. Again, the groups did not differ regarding socio-economic variables, brand attitude, and product involvement ($ps > 0.365$).

4.2.2. Results

Manipulation checks. We tested our assumption that the two cultures differ regarding their familiarity with VIs. It can be confirmed that

| Cartoon-like (cartoonized) virtual influencer | Human-like (unaltered) virtual influencer |

Fig. 10. Stimuli used in Study 3.

consumers from Hong Kong are significantly more familiar with VIs than European consumers (M_{Europe} = 3.00 vs. $M_{HongKong}$ = 4.05, $t(163)$ = -3.683, $p < 0.001$). This can be further supported by the greater PD towards the presented VI (M_{Europe} = 4.74 vs. $M_{HongKong}$ = 4.09, $t(147,94)$ = 2.806, $p = 0.003$). Again, irrespective of culture, the human-like VI demonstrated higher ratings regarding human likeness (M_{HVI}=5.01 vs. M_{CVI}=3.06, $t(163) = 7.992$, $p < 0.001$).

Hypothesis testing. To test H7, we conducted a moderated mediation (Process model 7) with VI type as independent variable, cultural setting as moderator, novelty as mediator, and aad as dependent variable. In line with our hypothesis, we found an interaction effect between influencer type and cultural setting on novelty ($b = 0.868$, $p = 0.033$). The conditional effect of VI type on novelty was significant for European respondents ($b = 0.506$, $p = 0.029$, 95 % CI[0.052; 0.960]), but not for Hong Kong respondents ($b = -0.362$, $p = 0.277$, 95 % CI[-1.016; 0.293], showing that the cartoon-like VI only heightens novelty perception for consumers low in VI familiarity. The difference between the conditional indirect effects was significant ($b = 0.492$, 95 % CI[0.080, 0.971]). As expected, novelty positively influences aad ($b = 0.568$, $p < 0.001$). H7 can be confirmed. The means for novelty in the four groups can be found in Fig. 11, followed by the visualization of the mediation results in Fig. 12 and the comparison of novelty and aad means in Fig. 13.

4.3. Discussion Study 3

The findings from Study 3 first indicate that Asian consumers feel more familiar with VIs than European consumers. Accordingly, the perception of PD is significantly lower. Our results further suggest that the implication that a cartoonish VI is an effective way to capture

consumers' attention by signaling novelty does not apply without restrictions. This recommendation only proves to be valid when consumers are not yet familiar with VIs. As familiarity grows within a consumer group, which is to be expected for the European market in the near future, the effect of the cartoon-like VI on novelty is likely to diminish. However, we only considered two different cultural settings, being aware that they are not representative of every potential target market. Further studies are needed to gain additional insight into the perception of VI across different countries.

5. General discussion

5.1. Summary of findings

It is safe to assume that the utilization of VIs in brand communication will persist in the future. Numerous brands are already relying on VIs instead of HIs, and we believe that their popularity will only increase in the coming years. In Asia in particular, the VI business is growing at a rapid pace and already seems to have become the new normal. VIs, who are not subject to the limitations of being human, offer several advantages to brands and therefore appear to be perfect endorsers (Audrezet & Koles, 2023). However, there is little empirical evidence on the impact of VIs in marketing communication. Our research seeks to better understand this phenomenon and to answer the question of how VIs should be optimally used.

Our first studies (1a and b) show that the degree of human likeness plays an important role in the evaluation of VIs. In line with Kim et al. (2023) and Yang et al. (2023), we found that a highly human-like VI leads to more influencer trustworthiness. But a more cartoon-like figure,
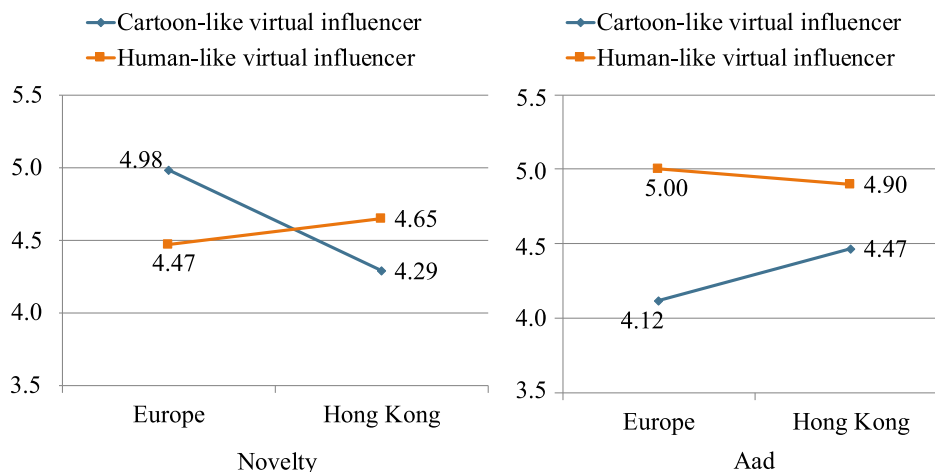

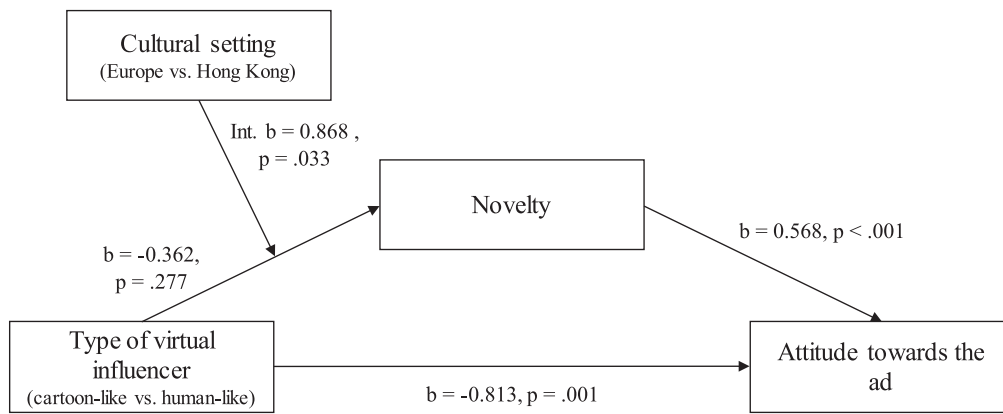**Fig. 11.** Mean values novelty and aad in Study 3.

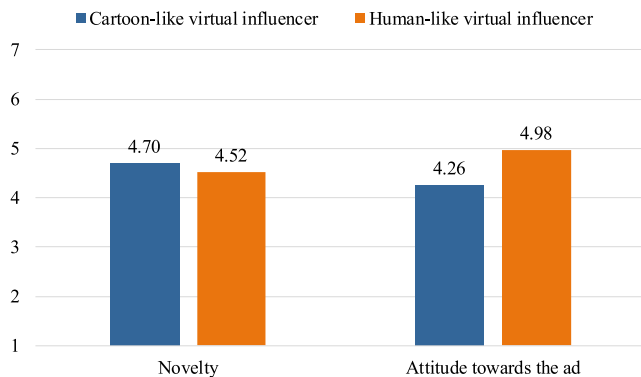**Fig. 12.** Results moderated mediation analysis in Study 3.

Fig. 13. Mean values influencer and ad evaluation in Study 3.

thanks to its stronger deviation from common advertising, can captivate with novelty. Since both these variables lead to the enhancement of advertising effectiveness, both types of influencers could prove to be suitable endorsers.

The second study demonstrated the reason for the different influencer evaluations: psychological distance. First, the results showed that consumers feel socially closer to the human-like VI which is in accordance with findings from human-computer interaction. Park, Chung et al. (2023) for instance, found higher PD perception for a machine-like vs. a human-like chatbot representation. Second, the distance construct could be identified as being "responsible" for the lower trustworthiness and higher novelty perception. Third, we found message focus to significantly enhance the novelty effect, in the sense that an abstract, why-focused product description further strengthens the effect of high distance on novelty.

In the last study, we identified familiarity with VIs as a boundary condition for the novelty effect. As soon as consumers get used to cartoon-like VIs, they are no longer able to trigger novelty, and their suitability as advertising endorsers needs to be reconsidered. This is in line with prior technology-related studies, finding that the novelty effect of a technology is reduced by heightened experience with the technology (e.g., Tokunaga, 2013; Yim, Chu et al., 2017).

Conclusively, our research sheds light on the growing phenomenon of VIs in brand communication. As the utilization of VIs continues to gain momentum, particularly in Asia where it has become the new norm (Miyake, 2022), it is imperative for brands to understand the dynamics at play in this evolving landscape. Our studies have highlighted the significance of the degree of human likeness, the role of PD, and the impact of consumer familiarity with VIs. The interplay of these factors is crucial in determining the optimal use of VIs in brand advertising.

5.2. Theoretical and managerial implications

Our research advances theory in several ways. First, by extending the so far meager knowledge about consumers' reactions to the VI phenomenon. We conceptualize two different types of VI according to their degree of realism and compare consumers' acceptance by means of two important variables contributing to advertising effectiveness. Second, by revealing the psychological mechanism behind VI evaluation, specifically the mediating role of PD between VI type and its evaluation. Most studies on virtual characters determining consumers' liking or disliking fail to address the underlying rationale of the evaluation. Further, proposing distance as a predictor for novelty perception is a promising and innovative approach, since research on the relationship between distance and novelty so far has been rather neglected. By this, we answer a call from Förster et al. (2009), who conclude that "future research should examine the relations between distance and novelty more closely" (p. 396). Third, we are among the first to incorporate CLT in the context of virtual characters. We contribute important findings to the extant literature on CLT (e.g., Trope & Liberman, 2010) by combining VIs issuing varying degrees of social distance with differently focused advertising appeals. While CLT is currently a subject of debate, with *meta*-analyses providing different outcomes depending on their adjustment for publication bias, we believe that PD remains a crucial variable in explaining consumer behavior.

We also deliver a critical review of our recommendation to use cartoon-like VIs as "novelty endorsers" by demonstrating in a cross-cultural comparison that this effect is dependent on familiarity. Ultimately, our studies significantly contribute to the CASA paradigm by shedding light on the distinct perceptions of cartoon-like and human-like VIs. Through a nuanced exploration of audience reactions to two different types of VIs, we provide valuable insights into the role of visual design cues in shaping attitudes, confirming the fundamental principles of the CASA paradigm (Nass & Moon, 2000; Reeves & Nass, 1996).

Managerially, we conclude that a human-like VI might overall be the safer option for a wide range of product categories. Products that need to exude certain values, such as safety, consistency, or trustworthiness (e. g., automobiles or furniture) need an endorser that does not feel too distant to consumers. Recently, IKEA launched a campaign with ultra-realistic VI Imma. As she was displayed in an installation in front of an IKEA store in Tokyo, customers could watch her "living" in a small room decorated with IKEA items. It might be harder to imagine a cartoon-like VI in such surroundings. The same could be applicable to CSR messages, initiatives supporting social causes, or sensitive issues in general (e.g., mental health), as such campaigns inherently require an exceptionally high level of trustworthiness, as evidenced by the findings of Yang et al. (2023). Further, in industries where decision-making carries high stakes, such as finance or healthcare, a human-like VI might be more suitable. The professionalism and expertise conveyed by

a human-like influencer can help instill confidence and trust, essential for consumers making critical decisions regarding their financial or medical well-being.

Cartoon-like VIs, however, can be particularly valuable for innovative product launches, infusing a sense of novelty and playfulness that may have a positive impact on the perception of the product or brand. Further, innovative products often face the challenge of differentiation in the market. By using a cartoon-like VI, it is possible to set the product apart from competitors. The unique and imaginative nature of the VI can help the product stand out and create a strong brand identity. However, marketers should consider the level of consumer familiarity with VIs in their target market. For markets where consumers have not been widely exposed to VI advertising, cartoon-like VIs may provide a novelty advantage. However, as audiences become more accustomed to VIs, this novelty effect diminishes.

Another setting where cartoon-like influencers might prevail could be the metaverse. The colorful and vibrant environment of the metaverse might provide a natural fit for the inclusion of cartoon influencers. Moreover, the primary user base in the metaverse, predominantly tech-savvy consumers (Ameen, Hosany, & Taheri, 2023), tends to have a strong inclination towards digital entertainment, including video games where they often interact with cartoon characters. Hence, cartoon influencers are well suited to engage particularly with these users.

In order to achieve long-term success with a cartoon-like influencer, there might be additional possibilities to consider, such as adding a human backstory or personality to the endorser. For example, the influencer could disclose hobbies, preferences, or emotions, "surprising" the consumer by the linkage of human properties to the virtual endorser. Previous studies showed that chatbot self-disclosing via an individual backstory evoked stronger feelings of co-presence and social attraction (Meng & Dai, 2021). However, marketers should be careful not to overstep, since consumers might feel threatened when the VI comes too close to an actual human being, especially considering the uncanny valley effect (Mori, 1970/2012).

5.3. Limitations and future research

Of course, our research is not free from limitations. First, the use of existing brands rather than fictitious brands enhances the external validity of our experiments. Through the realistic design of the advertisements, respondents were able to imagine the given ads more easily in their everyday lives. Consequently, the findings are more likely to be applicable to real-world situations. However, we are of course aware that potential pre-existing attitudes towards the brands might influence participants' responses. Thus, we controlled for brand attitude and checked that there were no significant differences in this regard among the experimental conditions. While choosing real-world brands is not an uncommon approach in (virtual) influencer endorsement literature (as seen in, for example, Janssen et al., 2022; Liu & Lee, 2022), future studies should consider utilizing fictitious brands to mitigate the risk of pre-existing associations with the endorsed brand.

As our studies laid their main emphasis on the evaluation of influencer and advertising materials, we have not yet explored the impact of VIs on brand perceptions. Future studies could expand the scope of investigation on the influence of VI use on brand-related variables. When using existing brands, comparing pre- and post-measurement of brand attitude could offer a promising approach.

Furthermore, it is worth noting that we did not account for follower status in our analyses. It is conceivable that consumers who are already following one or more VIs on social media might perceive a reduced sense of social distance compared to those who are not following any VIs. It could be valuable to conduct a study on the comparison of social distance perception between followers and non-followers. Indeed, it is not only followership that could be crucial, but also influencer recognition. The act of simple recognition might be adequate to positively influence consumers' attitudes, akin to the well-documented "mere-

exposure effect" (Janiszewski, 1993). In our studies ($n_{study\ 2} = 6$; $n_{study\ 3} = 5$), only a small fraction of respondents indicated that they recognized the influencer. However, as the prominence of VIs continues to grow, this aspect will become increasingly significant. Hence, we recommend that future studies incorporate recognition questions to account for this evolving dynamic.

Another aspect that should be acknowledged is that we exclusively employed female VIs in our studies. This choice was primarily driven by the current predominance of female VIs in the industry (Mirowska & Arsenyan, 2023). While we have observed a growing number of male influencers, the availability of suitable visual content for the creation of our stimulus materials was limited. Although we did not identify significant differences in male and female responses to our VIs, the gender of the VI could potentially affect consumers' identification with or acceptance of the influencer. This could potentially introduce gender-related biases in our findings, as respondents may have different reactions to advertisements featuring VIs of male gender or because female respondents felt more addressed by our advertisements. We attempted to mitigate this issue by using unisex and relatively neutral products and conducting analyses to identify any gender-related differences in our dependent variables. However, a more comprehensive understanding of gender-related disparities in VI endorsements requires further research. To address this limitation, future studies could explore the impact of male vs. female VIs and their potential influence on consumers' responses.

As mentioned above, we concentrated on lifestyle products, but other product categories and intangible products need to be analyzed as well since product category might play an important role in the evaluation process of VIs based on fit between VI and product, as found by Franke et al. (2023). In this regard, future studies could address the impact of VIs on attitude towards the product, since consumers may have a positive attitude towards an ad but may not intend to purchase the product if they do not like the product (category) or if it is simply irrelevant to them. Understanding both factors may enhance the ability to predict real purchasing behavior, by providing a more holistic perspective on the interplay between advertising content and product perception.

Another variable that warrants inclusion in future studies is the "uncanniness" of VIs. Several studies have already touched upon this aspect, such as those by Franke et al. (2023), which found that labeling a VI as such reduces perceived uncanniness; or Ham et al. (2023), which revealed that the combined presentation of a VI and a human, creating a "mixed-reality" scenario, elicits more negative evaluations compared to presenting the VI alone. Nonetheless, many questions in this domain remain unexplored. For instance, how do consumers perceive moving images of VIs in advertising, a format that is gaining increasing popularity (e.g., commercials for Renault Kadjar or Dior lipstick)? Does seeing these artificial figures in motion create an eerie sensation, or does their ability to move enhance their human likeness, potentially helping them overcome the uncanny valley?

When it comes to the manipulation of construal level, we only included message focus on either feasibility or desirability aspects. However, not every product would be applicable for an additional product description. For example, a perfume would not need an explanation on either how or why it should be used. Future studies should endeavor to find other possibilities to create low or high mental abstraction, e.g., by adding concrete or abstract product features.

While considering cultural differences between Asian and European consumers has brought very insightful results, we only observed two different cultural settings. We are, of course, aware that every Asian and European country has its own specific culture with its own unique characteristics that distinguish it from others. Moving forward, studies focusing on cultural differences as their primary objective should establish a clear demarcation of the compared countries, for example by establishing scales like Hofstede's cultural dimensions. Much research is still needed to enhance knowledge of cultural differences and to effectively reach consumers from diverse cultural backgrounds.

Future research should also address various other aspects related to the impact of VI advertising, such as exploring whether consumer attitudes change when the influencer is equipped with a human backstory or expresses emotions. Another question is the topic of control over the VI: Does a consumer care about the person behind the VI? Is it important whether a human or an algorithm creates the social media postings?

Another interesting and unexplored matter is the fact that some VIs use their social media networks to promote important social causes (e.g., LGBTQ movement, sustainability). It could be questioned whether VIs are entitled to align with certain values or advocate for socially debated topics or whether they should not be used as tools for promoting political or social agendas, given that they naturally do not have a personal opinion.

Lastly, future studies could follow different methodological approaches, e.g., combining qualitative and quantitative research methods, such as in-depth interviews or focus groups together with content analysis and surveys. By this, a more comprehensive view of the VI landscape could be offered. Beyond that, it would be promising to conduct studies with actual followers of VIs to enhance the studies' external validity.

There is a significant amount of research still to be done in order to gain a deeper understanding of the impact that VIs have on advertising and to offer meaningful guidance to brands and marketing professionals.

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CRediT authorship contribution statement

Claudia Franke: Writing – original draft, Methodology, Data curation, Conceptualization, Software, Visualization, Writing – review & editing. **Andrea Groeppel-Klein:** Writing – review & editing, Supervision, Resources, Methodology.

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