

"I Felt a Little Crazy Following a 'Doll'": Investigating Real Influence of Virtual Influencers on Their Followers

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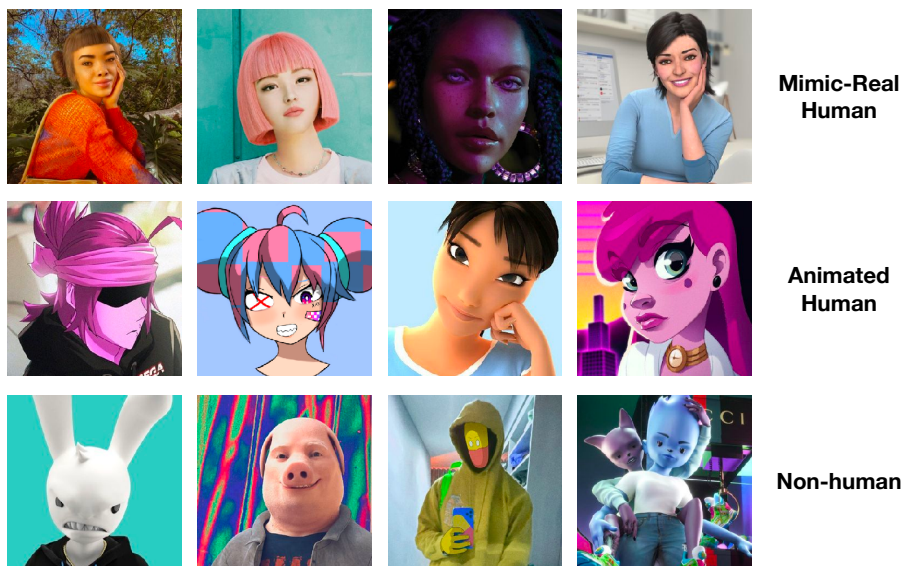


Fig. 1. An example of Virtual Influencers in the categories of Mimic-Real Human (@ilmiquela, @imma.gram, @alizarexx, @magazineluiza), Animated Human (@teflonsega, @yameiionline, @amiyamato, @anymalu_real), and Non-human (@guggimon, @john.pork, @iamchillpill, @dayzeeandstaxx).

Virtual Influencers (VIs) are computer-generated characters, many of which are often visually indistinguishable from humans and interact with the world in the first-person perspective as social media influencers. They are gaining popularity by creating content in various areas, including fashion, music, art, sports, games, environmental sustainability, and mental health. Marketing firms and brands increasingly use them to capitalise on their millions of followers. Yet, little is known about what prompts people to engage with these digital beings. In this paper, we present our interview study with online users who followed different VIs on Instagram

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beyond the fashion application domain. Our findings show that the followers are attracted to VIs due to a unique mixture of visual appeal, sense of mystery, and creative storytelling that sets VI content apart from those of real human influencers. Specifically, VI content enables digital artists and content creators by removing the constraints of bodies and physical features. The followers not only perceived VIs' rising popularity in commercial industries, but also are supportive of VI involvement in non-commercial causes and campaigns. However, followers are reluctant to attribute trustworthiness to VIs in general but display trust in limited domains, e.g., technology, music, games, and art. This research highlights VI's potential as innovative digital content, carrying influence and employing more creators, an appeal that could be harnessed by diverse industry and also by public interest organizations.

CCS Concepts: • **Human-centered computing** → **Empirical studies in collaborative and social computing**.

Additional Key Words and Phrases: virtual influencer; virtual agent; influencer marketing; Instagram; computer-generated imagery; social media analysis

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1 INTRODUCTION

A virtual influencer (VI) is a digital character with a first-person view of the world that is wholly rendered in computer graphics software and seeks to influence using media platforms [54]. Virtual Influencers (VIs) are a fast-growing trend in the field of social media influencers (SMIs), a term encapsulating new types of independent third-party endorsers who shape audience attitudes through blogs, tweets, and the use of other social media [18]. The use of virtual characters and virtual humans—virtual characters who are modeled after a human—is not altogether new. For example, the virtual band *Gorillaz* (@gorillaz) [61], has existed since the 1990s and has achieved both commercial and critical success; *Magazine Luiza* (@magazineluiza), has utilised *Lu*, a female-presenting virtual human, in its advertising for almost a decade and features "her" prominently on its YouTube channel [51]; and the computer-generated digital entity, *Ami Yamato* (@amiyamato), has also been creating YouTube videos and video logs since 2013. *Miquela's* (@lilmiquela) rising popularity since 2016 catalysed the creation of other such virtual entities that post regularly about their daily "lives" on social media.

VIs have gained momentum with the advancement of CGI technology. Their numbers have grown exponentially over the past few years along with their followers, and their actions and images on social media have become virtually indistinguishable from those of human SMIs, whom we could also regard as traditional influencers (TIs). For instance, *Miquela Sousa*, also called *Lil Miquela* or just *Miquela* (@lilmiquela), a 19-year-old VI with over 3 million followers on Instagram, was nominated as one of the 25 most influential people on the internet by *TIME Magazine* @time [53]. VIs have supplemented or even supplanted human endorsers in marketing and advertising. Investors have pumped in millions of dollars into firms that create VIs [30]. Brands such as *Prada* (@prada) [53], *Samsung* (@samsung) [40], and *Calvin Klein* (@calvinklein) [26] have used VIs to promote their social media performance. *KFC* (@kfc) has recreated *Colonel Sanders* as a VI [62], and *LG* (@lgusa) has created its own VI: *Reah Keem* (@reahkeem), supposedly a travel-loving disk jockey [1]. *Reah Keem's* possession of defined persona attributes is a common phenomenon among VIs and is outlined in their social media profiles and websites. Their posts might show a storyline unfolding in real time as an "online drama" [26], and they have been known to participate in political activism by supporting causes such as *Black Lives Matter*, and politicians such as Donald Trump [52]. These VI accounts often have dedicated teams and companies supporting them, such as *Brud* behind

Miquela, and *Balmain* behind *Shudu* [26]. This makes their digital presence not unlike that of TIs. VTubers too has been gaining currency in recent years, and some of them also act as VIs by our definition.

Despite the growing popularity of these new-age influencers, academic literature pertaining to them remains sparse. Previous research on VI has centered on a few popular and trendsetting VIs in fashion (e.g., *Miquela Sousa*, *Bermuda*, and *Blawko* [27, 44, 48, 52]). However, VIs involved in non-fashion-related domains were not covered; nonhuman or animated-like VIs were not addressed altogether, and the perspective of followers of VIs was inferred but not asked explicitly. To help reach a fuller understanding of VIs, a study was warranted to encompass a broader range of VIs, instead of only focusing on a few celebrated ones.

As the first interview study on long-term VI followers, our work makes several important contributions. First, we find several key factors that compel social media users to follow and interact with VIs. For example, VIs are liked for their visual appeal and creative content partly due to being unconstrained by human limits, and VIs evoke a sense of mystery among social media users. Second, we found that VIs democratise the influencer industry by enabling more diverse creators with lesser risks of being bullied. On the other hand, except in select domains, VIs are trusted less due to their virtual nature and opacity than their human counterparts, because they raise concerns about promoting unrealistic body images and not being transparent about their interests when supporting causes. Third, our findings highlight the opportunities for applying VIs in broader contexts, e.g., by non-profit activities for social good. Meanwhile, our work highlights remaining challenges for future applications and research.

2 BACKGROUND AND RELATED WORKS

2.1 The Rise of Virtual Influencers

The phenomenon of virtual influencers has been examined by researchers from various perspectives. Most focus on the rise of *Lil Miquela*: while some have undertaken a conceptual study [6, 14, 28, 41, 44], others have performed a content analysis of her posts and comments of her followers [27, 48]. There have been a couple of studies using interviews and focus groups of inexperienced users [3, 38]. There have also been experimental studies comparing the effectiveness of VIs as brand influencers [50] and on the factors involved in the creation and management of a VI [15]. For example, Robinson reflected on *Miquela's* popularity and proposed that the existence of virtual influencers poses an ontological challenge: *Miquela*, who does not exist in the physical world, is said to have a great impact on social media [44] and adds to the phenomenon of people becoming less able in distinguishing between the real and the virtual [14].

The ambivalence in ontological status is reflected in people's interaction with VIs. *Fullscreen's* marketing survey of 534 respondents of *Gen Z* and *millennials* found that 22 percent of the panel followed VI on social media, among whom 42 percent were unaware that the VI had no physical existence [11]. This was also reflected in the comments under *Miquela's* Instagram account; there have been heated discussions over whether she was real or not [27]. A study on Virtual YouTubers (VTubers) found that users perceived virtual avatars differently as compared to real-life streamers, regarding them to be in a "virtual world" and having different performative expectations from them [34]. The concept of "virtual world" is itself not new and applies to many social spaces on the internet, especially to games, such as *World of Warcraft*.

Related to the suggestion that the advent of VIs blurs the line of the real and the virtual [14], the mystery surrounding VIs may also lead to problems of authenticity and agency perception. Authenticity concerns the genuineness of experience [31], such as experience with brands or products. In this context, people expect influencers to be genuine about their brand or product experience

when making recommendations. SMIs recognize the issue of brand encroachment into their content and use strategies of managing 'transparency' and 'passion' to manage authenticity [5]. In the context of influencers, "passion" applies to content in their domains of interest and transparency to the disclosure of commercial interests. There has been limited work on the authenticity of VIs. Anderson & Sobek investigated the perception of authenticity of VIs with a focus group with a panel of 15 and an in-depth interview of eight interviewees. They found that VIs were unanimously perceived as less authentic than humans [3]; Molin found the same result for authenticity in an interview study that used similarly inexperienced users [38]; and only 23% of respondents in the aforementioned *Fullscreen* survey considered VIs to be authentic and 42% wanted to know about the brands behind them [11].

Agency has been given different definitions in literature [2]. In general, it concerns effective control over intended outcomes. Those high in agency are considered capable of taking responsibility for actions [21]. Robinson has expressed concern over the agency of VIs: considering that CGI is the major technique behind VIs, their actions and expressions are fully controlled by designers. He argues that *Miquela* "has no mind separate from her creators" [44]. This characteristic of VIs has a benefit for advertisers in that unlike humans, VIs cannot get involved in unwanted scandals. However, a study found that any VI transgressions may affect general perceptions about all VIs in the minds of followers [50].

2.2 Influence of Virtual Influencers on Social Media

The influencing capabilities of VIs have undergone limited study. VIs have been found to generate attitudinal and behavioural outcomes among followers. *Fullscreen* examined the impact of VIs on consumer attitude in their survey [11]. The study found that slightly more than half of VI followers had purchased a product, attended an event, followed a brand, and had actively researched a brand or product due to VI influence. Thomas and Fowler investigated the effectiveness of virtual characters as influencers in comparison with humans with two experiments [50]. They found that VIs elicited equivalent purchase intent among followers as do their human counterparts. In addition, VI transgressions harmed brands to a similar degree as well.

While VIs are a recent phenomenon, parasocial theories are well-developed and yield valuable insights. A study on celebrity interactions in the 1950s found that celebrities typically have one-sided interactions with their audience—parasocial interactions—leading to the formation of one-sided relationships—parasocial relationships—that are often so strong that some of their audience start considering the celebrities to be a part of their peer circle [24]. Since influencers have parasocial relationships with their followers as well as commercial interests [8], by extension, VIs are likely to have similar relationships and interests. To facilitate these relationships, experts suggest the creation of engaging VI storylines as an effort to develop a more sustained long-term relationship with followers [41]. For instance, the team maintaining *Miquela* has given her a well-scripted personality coupled with struggles, goals, and aspirations such that her followers can build an emotional connection with her. Indeed, Shin and Lee found that VIs can elicit more likes and comments if they express their emotions [48]. The use of brand stories is also done by SMIs and commonly uses certain emotional arcs for maximum impact [10].

As an emerging field, some have expressed concern over the reliability of effects generated by VIs on social media. Mainly, they raised doubts of whether VI would succeed in maintaining interest among followers because its followers may only be attracted to the novelty of VI [27, 41]. In the past, life-size mannequins with ultrarealistic features called the *Gaba Girls* had become extremely popular during the 1930s because of their unconventionally believable skin tone and texture, as well as their human feature imperfections; one of them named Cynthia featured in a lot of media coverage including LIFE Magazine [45]. Strikingly, Cynthia received beauty treatments

and attended nightclubs and social events with her creator, which closely resembles the online behaviour of present day VIs [13].

Some of the literature also suggests that the appearance of VIs affects their perception. The uncanny valley hypothesis suggests that VIs that are made to look humanlike may cause viewers to feel uncanny [39]. Empirical studies using cat images found that levels of realism for animal images in video games cause negative reactions, just as expected with created images of humans, and they thereby suggested designers to either opt for high realism or very low likeness [46]. This kind of U-shaped relation between likeness and likeability was also observed in a study using zoomorphic robots [33]. Seyama et al. [47] found that such a feeling is not due to realism but due to the presence of feature abnormalities. Thus, these studies suggest that the level of realism to which the VI are rendered might have a major effect on their perception. VIs that are not humanlike do not suffer from the effects of the uncanny valley. Experts have opined that VIs that are animated but not humanised have some advantages [41]. A paper theorises that non-human agents that may be perceived to be less judgmental and consequently easier to confide in [4]. Adding human characteristics may not always have the desired effect as was found in an experiment with virtual characters [57]. Therefore, we find that very realistic-looking VIs and animated VIs are expected to be perceived positively. However, no studies have included these different types of VIs and tested this perception.

As VIs communicate via virtual personas and avatars, the Hyperpersonal personal model in computer-mediated communication [58, 59] may be relevant to understanding them. The VIs are able to optimise their presentation to their audience and due to the limitation of face-to-face cues, this leads to over interpretation of the text-based cues received. While VI communication happens through multiple media, a significant part of the communication is text-based and so the model still might apply [60]. The study by Zhicong et al., however, found that the model did not always align with viewers of VTubers [34].

In sum, VIs, as created actors, possess unique characteristics that are distinct from human SMIs, but they could also be regarded as their extension. They are suggested to engage with followers with strong storylines and emotion-revealing posts. Studies have also suggested that they affect the attitudes and behaviours of followers, and VI perceptions might be related to their appearance. However, as aforementioned, research about VIs is mostly sparked by *Miquela*, who gained unprecedented success among VIs, surpassing even many human influencers. Though there are relevant theories, very little literature addresses the reasons behind the popularity and perceptions of different VIs. To fill this gap in the literature, we interviewed followers of different VIs and addressed the following RQs:

RQ1: *What makes online users engage with VIs (virtual influencers) on social media?*

RQ2: *How do online users perceive their interactions with VIs (virtual influencers)?*

3 METHODOLOGY

To address the proposed RQs, we conducted interviews with VI followers. In order to recruit participants, we first compiled a list of VIs from across the world, identifying them from published literature, websites, articles, and social media. Given the researchers' language backgrounds, we selected VIs with English-speaking commenters. We then identified commenters demonstrating significant engagement with VI posts and contacted them for interviews. Due to privacy concerns of the participants, these were conducted over email and instant messaging. The interview data were analysed using grounded theory and findings were organised across themes. Below, we detail the compilation and selection of VI profiles, VI follower recruitment process, and data collection and analysis.

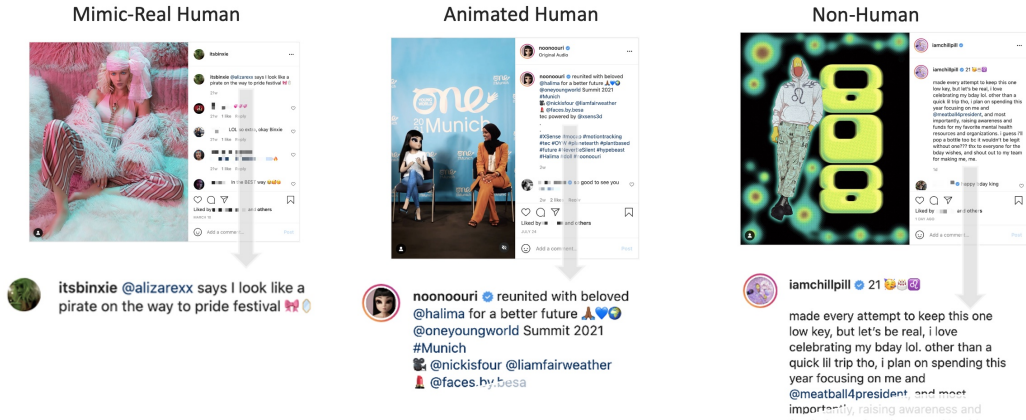


Fig. 2. Samples: *Mimic-Real Human* @itsbinxie’s post on fashion; *Animated Human* @noonnoouri’s post interacting with a human in the One Young World Summit; and *Non-Human* @iamchillpill’s post on mental health.

3.1 Compilation and Selection of VIs

The academic literature had scant information on the number of active VIs and their content. There was no identification of various VI types and their fields of activity. We did not want to accentuate the publication bias by focusing only on VIs featured prominently in published literature. Therefore, we compiled profiles¹ of VIs through a combination of Instagram searches, online articles, word of mouth, and websites.

3.1.1 Inclusion Criteria. The initial full list compiled did not have any regional and linguistic restrictions. We included all virtual entities that were posted in the first person, i.e. those that were interacting directly with the world in the posts as a sentient being would. This meant actions such as the VI talking about its feelings, posting a travel picture, enjoying a beverage, or clicking pictures with friends. This is different from a known human artist or celebrity using an avatar or anime character as their alter ego because the alter ego is not distinct from the human behind it. We thus excluded such accounts, such as @kayou and @corpse_husband. We included some VTubers who met these criteria: e.g. AI Angelica (@ai_angelica) is a VTuber who also posts about her life on Instagram and the human(s) behind her are not known; she behaves as if she has a mind and existence separate from her creators. We coded the VIs under the following categories (example in Figure 1):

- **Mimic-Real Human:** A *mimic-real human* VI is often visually indistinguishable from a human and often mistaken as such. The body shape, skin, and features are almost that of a real human. Some VIs might have tattoos or colors on their body as some humans do. For example: @lilmiquela, @imma.gram, @alizarexx, @magazineIuiza, @itsbinxie (as shown in Figure 2).
- **Animated Human:** An *animated human* VI is drawn in the likeness of a human being but as an animated, anime, or cartoon character. Although the VI is supposed to be a human, it is apparent that it has been drawn. An animated human would not be confused for a real

¹VI profile information is available in link provided in appendix.

human while a *mimic-real human* VI could be. For example: @teflonsega, @yameiionline, @amiyamato, @anymalu_real, @noonoouri (as shown in Figure 2).

- **Non-Human:** A *non-human* VI does not have the persona of a human being. Its persona is often that of an animal, inanimate, or otherworldly being although some might have some anthropomorphic features mixed with non-human attributes. For example: @guggimon, @john.pork, @iamchillpill, @dayzeeandstaxx, @janky (as shown in Figure 2).

3.1.2 Discovery of VIs. We undertook searches for compiling VI profiles between December 2020 and April 2021. We used VI related keywords, such as "Virtual Influencers", "CGI Influencers", "Biodigital Influencers", "Artificial Influencers", and other similar combinations on academic search engines, including Web of Science, Google Scholar, and web search engines including Google, Bing, and Duck Duck Go. We read articles referencing VIs in English and Chinese but also some Spanish, Portuguese, and Korean language articles using Google Translate. We added each VI mentioned in these articles to our initial list. We especially referenced *virtualhumans.org*², a website that is dedicated to information about virtual influencers and related entities, as it maintains a list of digital entities with basic biographies.

We next spent time reading the posts and hashtags used by VIs on Instagram and Twitter and inferred the hashtags used by VIs. Some common hashtags were #virtualinfluencer, #aiinfluencer, #robotinfluencer, and #cgiinfluencer. We used these hashtags to search on Instagram Discovery and the web search engines mentioned previously. Our viewing of VI also prompted Instagram profile recommendations to suggest us more VIs. Another mode of discovery of VIs for us was through their comments on popular VIs: it was not uncommon for a new VI to announce their virtual self in a comment on another VI's posts, such as *Lil Miquela*'s. We also performed these searches on Twitter, YouTube, and TikTok, and added them to our list, although we discovered that the VIs found on these media also had an Instagram presence.

3.1.3 VI profiles. Based on their websites, social media biographies, posts, interviews, and other promotional material, we gleaned other material for completing the profiles. These included origin country, independence or ownership by a brand, year of the first appearance, language of posting, social media handles used, and areas of interest. The list of VIs we profiled was heterogeneous and included many who were active on multiple platforms, including Instagram, Twitter, YouTube, TikTok, Facebook, and Spotify. Many of them had released songs, videos, art, and branded merchandise.

The search revealed 147 unique VIs from over 33 countries. Of these, only 23 accounts were owned by brands and used exclusively for the promotion of brand merchandise (e.g. the VI *Aili*, @labasrodo for *Labas*, an Internet Service Provider). These VI accounts were tied exclusively to one brand. Other VIs often collaborated with brands but were not exclusive for use by one brand. Five of the VI accounts had been closed within two years and another 30 accounts had been inactive for over four months; this meant that 76.7% of the VIs profiled were currently active. Though the profiles include some fictional characters with older debuts e.g. *Barbie the doll*, they are included only if they have acted in the first person, though such action was also found to be a very recent occurrence.

Although some VIs appeared earlier, their use truly took off after 2017: 89% of VIs in the list first appeared between 2017 to 2020. The use of VIs was not restricted to a few countries; VI accounts originated from at least 33 countries across six continents, pointing to global interest. The USA had by far the largest number of VIs with over 40 (27%), followed by the UK with 12 (8%). English is the dominant posting language among the VI accounts with 69% VI postings primarily in English. Of

²Virtual Humans: <https://www.virtualhumans.org/>

the three types of VI, mimic-real human VIs were the most common: 64% of the VIs included in the list were designed to look realistic like real humans; animated human and non-human VIs each accounted for 18% of the VIs profiled.

The VIs had fashion (43.5%) as the most common area of influence. Other common uses for VIs included music (25%), art or animation (9.5%), advocating for environmental sustainability or personal health (7.5%), selling toys and branded merchandise (11.5%, e.g. toys of the likeness of @guggimon, @dayzeeandstaxx). There were many VIs who had very topical interests in areas, including advertising, technology, economics, technology, and sports.

3.1.4 VI Selection. After creating the profiles, we used a mix of criteria to arrive at a list of VI whose followers were to be contacted. First, only VIs posting in English were selected, because English is one of the most commonly used languages in posts on social media. It is also the language the researchers were comfortable working in. Secondly, VIs that were owned by brands were excluded to avoid possible bias arising from attitudes towards the owning brands. Using these two filters yielded 88 VIs. Then, these VIs were classified by posting frequency: "active" who had posted within the past 4 months; "dormant" if they had not posted within 4 months but their accounts existed; and "deceased" if their accounts had been terminated or if the VI had been officially pronounced dead by their creators. From among these, we used the number of followers, area of influence, and their activity status (preferring active VI unless dormant VI were in a unique area of influence such as suicide prevention @officerbnice) as criteria to further trim the list to 65 VI; their followers were finally contacted.

3.2 Participant Recruitment, Data Collection and Analysis

3.2.1 Recruitment of VI Followers. After selecting the VIs, we recruited participants for interviews. We aimed to recruit participants demonstrating substantive engagement with VI content. Instagram is a well-known influencer platform, and it is the most common social media channel for virtual influencers in our profiling. We messaged user accounts who commented on a recent VI post on Instagram. As a post might have a lot of commenters, we chose those whose comments related most strongly to the posted content or those who had commented several times on recent posts. For example, meaningful comments were those that referenced the current or past history and content of the VI, or were direct answers to a prompt in the post. Followers making such comments were likely to have sufficient familiarity with the VI to provide richer answers to our research questions.

We contacted 350 commenters sampling from 65 accounts through direct messages (DMs) on Instagram through the first author's Instagram account in March and April 2021. Instant messages have the advantage of allowing both synchronous and asynchronous communication while also being able to reach a wider geographical base in an informal manner [56]. Interviews obtained through instant messaging have also shown promise as a feasible medium that produces quality data with satisfactory contact rate, response rate, and retention rate [32]. There were no hard criteria set for the number of people contacted per account, but we did not exceed contacting 15 persons for any one VI account. Approval from our university Institutional Review Board (IRB) had been taken in advance for the process. The commenters were informed of the study and their consent was taken for interview.

We conducted a pilot testing phase first, reaching out to 50 participants. We discovered during this process that participants were reluctant to share information using audio/video online. They were very wary of scams and tended to cease conversation when learning about interviewing over audio/video. However, they were more amenable to sharing information over text. Thus, we also gave all participants the option of responding to questions over email or direct message. Email is

known to be able to gather information from people who might otherwise be unwilling to share information [36].

We messaged 350 online users, received interview consent from 64 of them, collected interview responses from 32 respondents, and after filtering out two interviews for high number of non-responses, finally had full responses from 30 participants (27 via email and three through DMs). Our interview questions delved into reasons behind following and interacting with VI, memorable interactions they had with VI, their perception of VI, their actions and attitudes w.r.t influencer endorsements, and their attitude towards cause endorsement and awareness campaigns by VI. We reached back to the participants over DMs to ask supplementary or clarification questions. For example, we asked a participant to describe further why VI was initially scary for him and asked another participant in what context she used the word 'sensibilisation'. The communication with the participants also helped us make slight revisions to our initial questionnaire after the first few interviews. Three participants consented to audio/video interviews after initial responses but for the sake of consistency, we used DMs for additional questions for them as well.

3.2.2 Participant Backgrounds. The final interview sample of 30 participants, as shown in Table 1. The participants demonstrated a balanced gender representation (15 male, 15 female) and were from 16 countries across six continents with a mean age of 22 years. The average time for a participant following VIs was 19 months (median = 12 months, range = 3-72 months), indicating considerable following experience.

P2 followed 12 VIs (@lilmiquela, @bermudaisbae, @blawko22, @noonnoouri, @dadeko, @dion.coin, @pippapei, @imma.gram, @seradotwav, @ria_ria_tokyo, @plusticboy, and @ella.imagination.) Most of the others (23 of 30 participants) followed only one VI type. Among the seven participants following multiple types, only one followed different types of VIs. 12 respondents followed animated human VIs, 11 followed mimic-real human VIs, six followed non-human VIs, and one followed both animated and mimic-real human VIs.

The most common mode of discovery of VIs was through Instagram recommendations/ Instagram Discovery (36.7%) followed by word of mouth (20%), YouTube (16.7%), topic-based search (10%), shared by a celebrity (6.7%), and other modes, including Reddit, TikTok, and articles (10%). A total of 33 unique VIs were followed by those interviewed. The areas of influence these VIs were most active in were fashion (45%), promotion of merchandise especially of toys (24%), music (21%), art (12%), environmental sustainability and mental health (12%), and sports (6%). As some VIs were used in multiple areas, these percentages do not sum to 100. All participants also mentioned following multiple human influencers.

3.2.3 Data Analysis. The interview analysis was broadly performed using a grounded theory approach [19] using thematic analysis [49], a much-used method in qualitative research in Human-Computer Interaction (HCI). The first author conducted the interviews and then familiarised himself with the material in the transcripts. He then used open coding to code the data. These codes were initially terms such as "interest in art", and "implications of VI", "uncanniness due to realism". He thereafter identified themes or patterns within the data. Some of the participants had answered some questions inadequately or had raised interesting points which merited clarification or expansion. Thus, participants were asked some questions again specific to their answers, and this phase of interviewing followed the active interviewing approach [22] and was done in real-time via instant messaging. 90% of the interview participants responded to the additional questions. The collected data were coded accordingly. Then all the codes were collapsed into major themes that are presented in the findings section.

Table 1. The table shows the characteristics of the participants from Instagram with the type (number) of VI they followed, and areas of influence

ID	Age	Country	Gender	Type of VI followed	VI followed	Domains of application
P1	16	Singapore	M	Non-human	@john.pork	Travel
P2	19	Chile	F	Mimic-real & Animated	@lilmiqela, @bermudaishbae, etc.	Fashion, Envir. Sustainability
P3	15	Chile	F	Non-human	@dayzeeandstaxx @guggimon @janky	Toys, Art, Fashion
P4	16	Australia	F	Non-human	@john.pork	Travel
P5	20	USA	F	Mimic-real human	@alizarexx and @itsbinxie	Fashion
P6	21	Portugal	M	Mimic-real human	@lilmiqela and @alizarexx	Fashion
P7	17	USA	M	Mimic-real human	@blawko22, @lilmiqela, and @lil_wavi	Fashion
P8	26	Indonesia	F	Mimic-real human	@liam_nikuro	Fashion
P9	29	USA	M	Mimic-real human	@fnnmeka	Music
P10	20	India	M	Animated human	@a.i.channel_official, @ai_angelica	Music, Game
P11	20	France	F	Non-human	@bee_nfluencer	Envir. Sustainability
P12	14	Canada	F	Animated human	@officerbnice	Mental health
P13	19	Mexico	F	Animated human	@livinthefuture	Art
P14	26	Germany	F	Animated human	@anna_cattish	Art
P15	46	South Korea	M	Mimic-real human	@lmma.gram	Fashion
P16	28	USA	M	Animated human	@Ai_angelica	Game
P17	16	India	M	Mimic-real human	@fnnmeka	Music
P18	15	South Africa	F	Non-human	@guggimon	Toys, Art, Fashion
P19	32	USA	F	Animated human	@realqaiqai	Toys
P20	19	Turkey	F	Mimic-real human	@lilmiqela	Fashion
P21	21	South Africa	M	Animated human	@Ai_angelica	Game
P22	17	France	M	Animated human	@yameiionline	Music
P23	26	India	F	Animated human	@teflonsega	Music
P24	16	USA	F	Mimic-real human	@itsbinxie	Art, Fashion
P25	15	Netherlands	M	Animated human	@Ai_angelica	Game
P26	42	Brazil	M	Mimic-real human	@longottlich	Sports
P27	23	USA	F	Animated human	@realqaiqai	Toys
P28	32	Indonesia	M	Animated human	@noonouri	Fashion, Envir. Sustainability
P29	17	Belgium	M	Mimic-real human	@phoenixmcewan	Sports
P30	19	USA	M	Non-human	@iamchillpill	Music

4 FINDINGS

4.1 Factors behind User Interaction with Virtual Influencers (RQ1)

Our participants shared multiple factors that drove them to follow and engage the VIs. For example, VIs' posts were entertaining and creative without being limited by human's characteristics. Meanwhile, participants were amazed by how the VIs acted like humans by expressing emotions and responding to followers in a timely manner. Additionally, mimic-real and animated human VIs appeal more visually for fashion-related topics and non-human VIs promote creativity for industries such as art and music.

4.1.1 Content-driven Interest. Participant interaction was strongly motivated by the content posted by VIs, such as text, pictures, audio, or video. The reasons for this interest lay in entertainment value, creativity, storytelling, or disenchantment with traditional influencers (TIs).

Entertainment Quotient. Entertainment was listed as one reason for following VIs by a majority of participants. Related adjectives mentioned in the interviews were "amusing", "entertaining", "cool", "funny", "unique", "creative", and "extraordinary". "Coolness" was mentioned by eight participants, funny by seven participants, and entertaining by five participants while talking about the VI. However, there was variance in what they found entertaining.

The majority of the participants following VI in music referred to musical content as their main reason for following and those following VI creating art liked their art. Others found the posts funny. The entertainment quotient factored in both following behaviour and interactions: likes, shares, or comments. P19 said, *"I like or comment SOLELY if I'm entertained by the content."* P4 had an ongoing inside joke with her friends about interacting with *John Pork (@john.pork)*, an anthropogenic VI with a pig's face, and this running joke increased her interaction. P11 recalled liking posts of *Bee Influencer, (@bee_nfluencer)*, and mentioning friends because she expected to make her friends laugh. The VI phenomenon thus contributed to light-hearted banter among friends and this could be a reason why a high percentage of the participants discovered VIs by word-of-mouth, including friend shares.

Getting vicarious pleasure from being able to glance into the lives of others was a big reason for some followers and the VI's life being virtual even had a positive impact in cases. P4 expressed it directly, *"I suppose I like to peek into someone else's life."*, as did P18, *"I love seeing people doing what they love and enjoying life. So I feel happy."* P1 shared pictures of *John Pork* with friends because he found it entertaining that the pictures were like that of normal people on social media but *"with the strange twist of the CGI of John Pork."* P8 explained that *"because for me both of them are an influencer, so when they post something good and I like it, I will put love at that post."* The enjoyment of seeing other's lives increased when celebrities could be seen involved in the VIs' lives. P20 was piqued by how Miquela *"meets big celebrities. Like Bella Hadid. Millie Bobby Brown."*

Interactions with VI accounts were often similar to that with human accounts. This was observed particularly among followers of mimic-real humans. P7, who was following *Lil Wavi (@lil_wavi)* and *Blawko (blawko22)* described why this occurred: *"I feel like the accounts are run by real people, so I talk to the account like a real person would."* P8 who followed the mimic-real human VI *Liam Nikuro (@liam_nikuro)* said that looking at his posts was like seeing a real person's Instagram. P2 was most expressive, *"At the end the 'concept' is the same, people you admire and like posting stuff to share their lives and stuff of your interest, at this point if the person on the account is real or a CGI doesn't really matter to me. It's still impressive though when it's a VI. I'm not gonna lie in that part."*

The emphasis on content was apparent from participants expressing interest in the "story" of the VI or in it being "funny". P13 was interested in *"the message they give, the art style, and mostly the stories they're communicating."* P10 said, *"It's fun content to watch and I treat like I would treat*

any other creative influencer's content." P24's general criterion for following Instagram accounts was: *"if the person running the account has a sense of humor that I like."* The jokes made by Binxie, @itsbinxie, pertaining to being an alien were very funny to her. P18 too mentioned content quality influencing her interactions with the non-human VI Guggimon (@guggimon), *"I just like his content! He's funny and I like his design :) other than that I follow him for his products. It's kind of a toss up for me that if they have good content I'll most likely like them but if they're boring I just don't want to interact with them."*

Content Creativity. The creativity of VI content was apparent in reactions of followers. For example, P23 called VI content really unique and new. P28 expressed, *"They (the team) very creative and they have the box idea to keep virtual influencers more interesting with their new post."* P17 termed VI content *"extraordinary, whether good or bad."* P24 liked the unique vibe of Binxie and admired her aesthetic. This indicated that the freshness of the content was key to interest from such discerning viewers. P16 described that VIs' creation of such high quality content piqued his interest and curiosity. P17 said he was *"amazed by the magic of artificial intelligence as well as VFX."* He remarked that TIs are limited by their human form while VIs can create unique content: *"The limitations that traditional influencers face is simply the fact that they are human. As an actual living being, there are certain boundaries to the things they can do. On the other hand, a virtual influencer is just the creation of a human. It can and will do anything one can dream of. This makes their content unique, be it Reels, posts or stories."* The interest in creativity also extended to the realm of advertisements, as P23 said, *"A product advertised by a VI can definitely be very interesting in my opinion as they can get really creative with it."*

Part of the interest in VI content was also due to their creative content appealing more to participants than that of TIs. Several participants interviewed (n=9) said that they found TI content less interesting using words like *"boring"* and *"meh"* to characterise their content unless they were interested in the personality or were following their career closely. P26 expressed his frustration with TIs, *"I feel that everything is the same, we always want to see the novelty, and not be seeing one copying the other all the time. Tired!"* P10 was not interested in TIs who *"post pictures of themselves with no substance."* Moreover, he preferred VI advertisements to TI advertisements as the former were more creative and less likely to be scripted; the latter had more reused content. He emphasised that he would not watch VI with generic content or VTubers who reused their content either. This sentiment was noted among participants following all three types of VIs in this study.

4.1.2 Novelty of VIs. The uniqueness and newness of the VI phenomenon created interest among many of the participants. They were fascinated by how VIs were able to perform everyday actions and express human emotions. They were also interested in the virtual reality of VIs and their perceived simultaneous existence in both virtual and human dimensions. Virtual reality enabled VIs to go beyond human limitations and utilise more visual effects.

Virtual Beings with Human Actions and Emotions. There was an interest generated due to VI emulating human characteristics which was related to the novelty of the VI phenomenon. As P24 put it, *"Virtual influencers are liked for their aesthetic. Being virtual is sort of part of their thing."* P20 said of Miquela, *"She is so different. She is a virtual influencer and I've never seen anything like this. She isn't human. But her body is like a human body. So something interesting."* P1 said that the *"twist"* of the CGI of the VI is key to its charm because otherwise there are too many influencers, *"It's unlikely that I would follow it anyway because without the twist it's quite boring."*

P25 spoke of the animated human and VTuber AI Angelica, *"I am very interested in her as she's not human but shows emotions."* P10, who also followed the same VI expressed VIs' unique attraction *"They have their charm of not only having fun personalities but also fun role-playing futuristic ideas"*

like self intelligent AI that's cutesy since they don't act perfectly... I was mostly impressed whenever I saw new design they would show, either of themselves or the virtual environment they were in." Even the joke he made in a comment about dating AI Angelica by downloading his consciousness to a computer was only applicable to the virtual context. P26 liked the idea of "*merging the real with the virtual*" and expressed his desire to be a part of every story of *Ion Göttlich*, *@iongottlich* as an "*everyday character*".

Curiosity and Mystery about the VI. We found that VIs evoked our participants' feelings of advanced technology, artificial intelligence, and cybernetic themes, which made participants curious to learn more about them. The fact that the humans behind the account weren't visible also helped interaction. For example, P5 was initially attracted to VIs because she found their implications interesting. She called the CGI or digital rendering used really impressive since it was being used "*to create a fake person*."

"*Not knowing who runs the account adds to the mystery and intrigue*" contributed to participants' following and interaction, as P19 shared. For example, P11 found commenting easier: "*With a VI account, I comment more easily because it's lighter, I never comment on other accounts because I figure that stars or other celebrities can read and I don't necessarily seek more interaction with them. With a VI account, I don't really think about the person behind the account because I figure the person is more detached, for bee influencing for example it's just a small part of their job I guess.*" Meanwhile, VI accounts are frequently mysterious about the persons behind them and this imparts a thrill and challenge to following and learning more about them. P16 and P23 shared why they followed VI, as P16 explained: "*Curiosity! I know little of the technology that goes behind it but I see the future potential in accounts like this and find them very interesting.*" P29 told the story of how he started following a mimic-real human VI account (*@phoenixmcewan*), "*I feel like they are unknown to the majority of the people. And because they are mysterious. A lot of people do research about them. But find nothing truly saying what and who they are. So I think the aspect of the unknown is a huge factor. That's also how I got into VI. I watched one of my favorite YouTubers Jimmy Broadbend. He does sim racing and he was in a championship where they didn't know their teammate. Until the race happened and he was talking to this guy Phoenix McEwan. Never heard of him. It was so strange hearing them talk. And I didn't know what he was. So the next 2 days I spent my time on the internet trying to find out who he was. But I didn't find a clear answer.*"

In a similar vein as the participants following mimic-real human accounts, P19 spoke of her intrigue following the doll-like *Real Qai Qai* (*@realqaiqai*), "*I felt a little crazy following a 'doll', I love her comments plus I'm intrigued as to who actually runs the account.*" She explicitly said, "*Not knowing who runs the account adds to the mystery and intrigue.*" P23, who follows the anime musician *Teflon Sega* (*@teflonsega*) talked about the "*mysterious essence*" of VIs as well, "*As we don't generally know who is behind the creation of the contents of VI's post, so there is a certain form of imaginative visual approach to their contents which makes it very interesting and captivating.*" P29 follows VIs because of "*the unknown aspect of them, I find this very intriguing.*" P4 likes the wilful suspension of disbelief inherent in VIs, "*I like virtual because I feel less inclined to worry about their real-life counterpart, I also feel they are much more enjoyable to emotionally invest in because they are funny. I guess my brain forgets that there is a real person behind the account.*"

4.1.3 Responsiveness and Encouragement for Interaction. Many participants showed a higher degree of engagement with VIs than with TIs as exhibited by greater commenting behaviour, though like and share behaviour was not reported as different. Responses indicated that most participants in our sample either indicated greater engagement (n=10) or interacted to the same extent (n=13). Positive VI responsiveness was noted by followers of all VI types.

VIs responded often to their followers through likes or replies. P4 said, *"I interact with john because he consistently acknowledges me through a like or a reply."* This makes them different from traditional influencer accounts. *"Regarding commenting, I know traditional influencers won't see my message (because they get tons per day) and I really don't have anything to say. VI accounts, on the other hand, you get to know which of them actually read messages and answer comments. In likes, I like both in the same way."* P26 similarly spoke of the VI *Ion Göttlich* responding to his comments, *"Yes, I usually interact, but in the case of Ion's Instagram, he really answers us and that makes it stand out ... after all, social networks should be in that sense!"* P30 also really liked how the VI he follows communicated directly with a fan like him. VIs also pinned comments or contests. P13 said, *"Every post they make is actually encouraging you to post a comment. It encourages participation from the audience."* P17 recalled that a comment of his was pinned by *FN Meka, @fnmeka*. P30 participated in a contest hosted by *Chill Pill (@iamchillpill)*, and won a gaming console. Encouragement to produce more content was another reason to engage with VI. P16 said, *"I like all their posts because I want to support the content they are creating and encourage them to create more. Sometimes I will comment in the hopes of eliciting a response from the VI or other fans."*

This is contrast with TIs, who were said to have too much activity on their posts and did not interact with followers much which has a discouraging effect on engagement as exemplified by P1's thoughts on TIs: *"They have 1,000s of repetitive comments and the actual posts are quite boring"*, or those of P4, *"I don't interact with traditional at all. they tend to have a much more substantial following so the attempt is futile."*

Meanwhile, some participants perceived their engagement differently. For example, P15 was familiar with virtual reality and technology and so was more impressed by the visual rendering. P6 as a graphic designer was very impressed by the art behind *Lil Miquela* but does not display curiosity or intrigue about VIs, recognising them as *"just pixels"* and stressing repeatedly that he did not have a *"parasocial relationship"*. P15 repeatedly stressed that *Imma Gram, @imma.gram* was *"not real"* and that he was more comfortable interacting with TIs.

4.1.4 Visual Attractiveness Associated with Fashion and Both Mimic-Real Human VIs. Many of the participants found VIs to be visually very attractive. This was observed commonly among those following mimic-real human VI but some followers of animated humans also expressed similar perceptions. With one exception, those following non-humans either answered that attractiveness was not applicable or talked about the attractiveness of the VI content or their endorsement.

Followers of mimic-real humans VIs expressed that as VIs had been modeled on attractive humans, they were bound to be attractive. P6 felt that *"VIs are obviously created based on mainstream ideals of beauty, so they all look generally 'attractive'."* P8 called both traditional and virtual influencers *"really attractive."* and P4 too felt that they were the same in attractiveness. P20 found the mimic-real human *Miquela* to be very attractive. P24 did not even realise that the account she was following was that of a VI because she found the content visually pleasant and *Binxie* to be as attractive as any TI. Participants recounted times when the reality of VIs impressed them. P15 talked about *Imma Gram*, *"Her very delicate appearance gives me an astonishing moment. Even though I know she is not real, but I can't help stopping WOW moments."* Interestingly, P15 alluded to feeling *"weirdo"* when looking at her up close although he said that this might be because he knows she is a VI. P5 similarly recalled being impressed by the realism of a photo in which only the eyes indicated that the (*Aliza Rextx @alizarexx*) was not real. This was also how P23 felt, *"In comparison to traditional influencers, VIs are created to capture the attention of audiences hence the attractiveness of that particular character is designed in that way, which means the attraction is their default characteristics."*

For some, the perceived *'fakeness'* of mimic-real humans VIs seemed to be part of their visual charm. P5 felt that a VI could be even more attractive than mainstream models: *"Both are stylized"*

to be attractive (though a virtual influencer could certainly win in the attractive category because they're fake; you can make them look as close to the beauty standard as you want ... I respond to Virtual Influencers more positively because I know that the model is fake, and there is a person/team of people behind the scenes working hard to make this "fake person"." This was also why she found their flaunting of attractiveness less irritating than that of traditional influencers: "Maybe because I know they are fake, and someone is working really hard to make a fake person??? It's like the "artist" or "creator" or whatever of the virtual influencer is showcasing their abilities/progression. Like an artist would, posting their art."

Similarly, visual attractiveness was also a part of the charm of animated VTuber *AI Angelica*. P10 was very inclined to watch some VTubers due to their ethereal beauty "since they're made inhumanly (sic) beautiful." P21 repeatedly mentioned the "cuteness" of the same VI and others like her. The fact that the VIs were animated did not hinder typical perceptions of beauty and cuteness for these participants. On a contrarian note, P16 and P25 did not find animated/virtual avatars attractive even though they knew of others who did. P29 and P1 were not interested in VI for their attractiveness. Some other participants too did not attribute attractiveness to apply to VIs, especially those following non-humans. However, even non-humans could be visually attractive as toys. P3 says why she follows the non-human VIs @guggimon, @janky, and @dayzeeandstaxx, "I think that is related to the fact that at least @.... don't look very human, that is, those are very colorful, like more visually attractive."

4.1.5 Relationship between VI Application Domains and Interaction. Participants who followed mostly animated VIs, non-human VIs, or VIs that had a narrower domain focus, did not find attractiveness applied to VIs. This was in contrast with those who followed mimic-real human VIs for fashion-related topics. Mimic-real human VIs were noted by participants for their interactions with other VIs and celebrities.

Followers of animated human VIs who had music as their primary topic of posting mentioned music and creativity as their reasons for following. For example, P30 explicitly said that he followed *Chill Pill* for his music and not due to his persona. P22 followed *Yameii* (@yameiionline) to stay current with her latest songs and liked her music well enough to try to buy a hoodie with *Yameii* on it though he couldn't do so as it was out of stock. In our sample, we found several animated human VIs who were followed for their art. P13 also was most interested in the art style of *Liv in the Future* (@livinthefuture). P14 liked looking at pictures of *Anna Cattish* (@anna_cattish) to learn the styles. Interest in art was also prevalent among followers of some mimic-real human VI because they liked seeing how the VI was created to that level of realism; they considered them digital art. For example, followers of mimic-real virtual rapper *FN Meka* noted his art styles (P9) or his endorsements (P17) rather than his music. There were also cybernetic posts of VI that participants liked. Some participants were either in the creative field themselves or indulged in art as a pastime and thus were really interested in the artwork. P6 said, "I also appreciate the artwork, I'm a designer so I'm very interested in the whole artistry behind these creations." P24 took inspiration from *Binxie* for her drawing as she found "her" pretty as well as her poses. P9 liked the cybernetic theme of *FN Meka*, "I like cyberpunk themes and comic books and he fits that. It's cool I appreciate the art." Participants interested in art tended to follow animated human accounts more. P26 liked how an athlete's training and daily life were shown by the VI.

Involvement in more niche domains was not specific to any single type of VIs and participants often followed such VIs due to their specific domain interests. P29 was following a virtual racing driver *Phoenix McEwan* as he was interested in racing themes but he clarified that he would never follow a VI because of attractiveness. Animated VIs were followed more for their music. P26 is an avid cyclist and he follows *Ion Göttlich* due to his interest in cycling. P15 became interested in the

mimic-real human VI *Imma Gram* due to his interest in AI, big data, and virtual assistants. Followers of *AI Angelica* followed her because of her gaming content as well as interest in cybernetic themes.

Some of the animated or non-human VIs were followed due to their involvement in environmental or social causes. P11 recalled that *Bee Influencer's* personification of the bee made her laugh. Those following VI involved in support of causes appreciated the humour in the delivery. P12 lists being 'funny' as the reason she follows *Officer B Nice*. P28 was following *Noonoouri (@noonoouri)* due to her uniqueness: *"Unique style, bold character, and inspiring quotes."* He thought that the team behind her was very creative and always had out-of-the-box ideas. He also liked the positive message of environmental sustainability shared, *"She always share inspiring words and a great reminder to respect nature. Love it!"* *Noonoouri* is an exception among VIs as she posts about both environmental protection and fashion. She was the sole animated VI among twelve that P2 was following, with all of them being involved in fashion, and the remaining being mimic-real human VI. While mimic-real human VIs followed by our participants did support causes, their posts mostly focused on their main content area.

In summary, the above factors revealed that there were similarities in following and interaction behaviour between followers of different types of VIs. Participants noted high responsiveness among all types of VIs. They also commonly experienced the feeling of being in a virtual reality and associated feelings of mystery and intrigue. Animated human or non-human VIs were more likely to be in areas of art and music while mimic-real-human VIs were more likely to be in fashion. The animated and non-human VIs were more likely to be acknowledged for their creative content. There were some differences between types of VIs in perception too.

4.2 Perception of Virtual Influencers (RQ2)

4.2.1 Existing in Another Dimension. A common perception among participants was that VIs had a separate existence from humans, as if they had an alternative dimension to themselves but still interacted with the human reality. P8 remarked, *"It's so interesting following AI influencer, like they are alive but they are in different condition with us."* This perception was reinforced with interesting backstories as explained by P2, *"A few of them have backstories and others are actually telling a story through each post, kinda like those Alternative Reality Games that you can follow in real-time but those are also in our reality."* P7 was fascinated by *Lil Wavi* on Instagram because *"it's an AI created living in someone's computer."*

Followers found it interesting when a virtual character described her life as if she were a real-world entity. P26 attributed the blending of the real and the virtual as the reason why he followed *Ion Göttlich*, the cyclist, *"I love this thing about joint intelligence, as soon as the cartoon portrays or merges the real man with the virtual man! Merging the real with the virtual is a good idea. Be a touch on training or mention the athletes' daily lives."* P13 recalls why she was very impressed by *Liv in the Future* *"because it was a fictional character talking like she owned an Instagram account, and the story was super interesting."* P26 talked vividly about a particularly impressive post illustrating this blending of the real and the virtual, *"I remember seeing the ion in a simulator in the wind tunnel, he looked like a person, but the fact that he looks like a very strong athlete, gives credibility, even though he is a character."*

P2 was impressed by the ability of VIs to post; she considered the feeling to be like seeing a 'sim' in the real world. She explained her intrigue regarding VI's interactions with actual people, *"@lilmiquela posted a photo with an actress that I follow saying that they spend the day together. I always wonder what people 'see' when they're face to face with VIs, is it actually somebody in there? Do they [human celebrities interacting with VIs] sign a contract of confidentiality promising not to tell anything about what happens at that moment? Do they just pose and then they photoshop the VI? Do they only talk to the people that are behind the VI?"*

4.2.2 Not Real Resulting in Less Trust. VIs evoked divergent responses among participants in terms of trust, but their overall trust perception was not favorable. Nine participants displayed a lack of trust for VIs as against three who trusted them more. Five participants trusted them equally. The rest said that they lacked trust in both VIs and TIs. Its general effect on followers apart, trust was also reflected in the participants' response to endorsements and their purchase decisions. Half of the participants in our sample had made no purchase decisions based on any influencer endorsements. Twelve participants had made or tried to make purchase decisions based on TI endorsements and eight had bought or tried to buy products due to VI endorsements.

The participants who had difficulty trusting VIs expressed that they had trouble attributing trustworthiness to wholly digital creations with no real existence. They were likely to trust TI endorsements as humans could use the endorsed products and also demonstrate the consumption process. P6 said, *"Of course not, there is a product from a company, I don't trust something that does not exist, they're just pixels."* P12 remarked, *"You don't know them as a real person so it may be harder to trust."* P8 trusted TIs more because they are *"real human"* though she did note that VIs could be preferred when TIs appear too desperate for attention or cause conflict. P17 explained why he was more likely to purchase based on TI recommendations, *"Traditional influencers are human and you can take their word for something and see their experience with the product... VI endorsements are not as trustworthy simply because no real human is recommending your product. You cannot count on the word of a robot."* P18 was clearly against VI endorsements, *"I don't like them. They sound so fake and make me not want to buy their product."* while TIs could handle/play with the product and make her want to get it. P7 also said that *"it is harder to trust an AI"*. Despite the fact that P18 had spoken very positively about VI content, the participant trusted TIs more: *"I don't interact with VI accounts, only traditional as I trust them more. I usually share traditional influencers' posts more and comment more on their posts. I usually only like more VI posts than TI."*

Of the 13 participants who believed that all influencers, whether TIs or VIs, were equally untrustworthy, many put forward reasons that influencers were *"fake"* and had vested, usually commercial, interests, using descriptive terms, such as *"selling out"* (P5) and *"scam"* (P7). They were also perceived as fake. In P12's words, *"I feel like nowadays people post pictures of themselves with Photoshop, etc, social media is becoming 'fake' kind of."* P11 felt that she did not *"know who is really behind the account or his intention"* but said that this applied to a traditional account as well *"Because I am wary of product advice from someone who is paid to give it"*. P22 was one of the few who trusted VIs more, *"I find traditional influencers much more fake than Virtual ones"*.

Some specific areas of VI applications were trusted more by a number of participants. VIs were seen by them to have expertise in areas of technology, software, and digital art though some of them had also bought other types of products on VI endorsements. P5 said that she could potentially be persuaded by VI on *"tech stuff; like Photoshop programs or gadgets, Probably also digital art?"* P10 said he could buy VI endorsed creative products or software. P16 implied that a VI endorsing a product might have a positive impact on his view of the sponsoring company, *"I'll also pay more attention to the endorsement and likely form an opinion about the endorsing company that this must be a 'cool' and 'in touch' company for having awareness of this VI."* P23 was interested in products that VIs can or might use, thus indicating high trust for VI endorsements of editing applications but minimal for skincare or beauty products. However, P28 had also bought fashion and food products based on a VI's endorsement, trusting that the creative team must be using the product.

When participants trusted in VIs' technical abilities, VIs' improper endorsements could risk breaking the trust. P16 denoted, *"I think there is an unspoken bond of trust between many of us denizens of the internet. We grew up and were raised online. Someone who possesses the technical ability of angelica gets a good reputation with the community. Trust is a delicate thing and shameless cash grab endorsements will quickly see that community turn its back on you."*

4.2.3 Positive Perception for Awareness Campaigns and Social Causes. Participants perceived VI involvement in non-profit causes and awareness campaigns positively. While some VIs they followed were already actively promoting some social causes and so participants spoke from experience, other participants spoke hypothetically. However, we also found some participants who were less convinced regarding the intentions of VIs. We found both such sentiments to be prevalent among participants following VI types.

Participants felt that the large follower bases VIs should have been harnessed for good purposes. For instance, P27 and P28 felt that influencers had a responsibility to use their platforms for social causes, *"I think that it's good for VIs to support activist causes because I don't think that influencers should only use their platforms to market/sell goods."* P3 expressed, *"It's really good because they have a lot of followers and people seem to look up to them so the fact that they help is really great."* P2 had a similar positive sentiment, *"I feel like it's a good thing, since VIs are getting so popular, it's great that they address important topics such as health, environment, etc. More people would be aware of what happens surrounding those topics and they could (possibly) get involved in it, which means that there's definitely a big impact because of the VIs."* P17 was supportive as well, *"I would support any such campaign started by a virtual influencer just as much as I would support a traditional influencer. As long as there is a human with a noble cause under the mask of a virtual influencer, it does not matter to me. :)"* P12 had been following Officer B Nice, @officerbnice due to the VI helping people on mental health. P4 in fact preferred a VI campaigning *"I think it's really important the influencers support social awareness campaigns because they have a wide platform, and strangely I'm more inclined to take advice from a CGI pig than a real person."*

Endorsements of a social cause often involved a VI sharing its opinions. In this regard, some participants felt that human and virtual influencers were equally capable of voicing opinions and should be heard equally. P22 also felt that VIs could have a say in topics just as TIs do. P19 felt that the humans behind VI meant that they were not that dissimilar from TIs, *"It makes me feel no different than if an actual influencer was doing it. A human still runs that account to some extent...there are bound to be similarities between the two."* P9 was emphatic in her stance on equality of VI and TI, *"They shouldn't be treated any differently than human influencers. Human and virtual influencers are equal."* P14 mentioned Barbie's videos on mental health as an example of how they could be used for awareness. A VI supporting a social cause not only makes it more powerful but also makes it easier for supporters of the cause to spread the main message. One of the possible reasons is that endorsement by a VI makes the messages fun, simple, and easy to share for followers. P11 followed the *Bee Influencer* account that supports the cause for bees and sustainability as she finds it to be making the cause *"more powerful"*. P26, a follower of the virtual cyclist *Ion Göttlich*, too remarked how VI content was often playful and everyone liked it. He was highly supportive of VIs supporting activist causes as *"they help raise funds and promote and keep the culture alive."* P11 spoke of how the non-human VI *Bee Influencer* relates to her, *"Because it supports a cause that I'm defending too and I'm telling that it makes the cause 'more powerful' and also it gives some information simple and great for explaining things to my friends who won't be interested in the cause of bee."*

Some participants also identified other opportunities for VI to contribute. P5 says *"Maybe virtual influencers could do some good as well??? You can do whatever you want with them, so you could take amazing photographs without endangering anybody. You could replace child actors with these fake people, to keep children out of that Hollywood drama stuff that exploits kids and all that. You could design them to help with role-playing therapy."* P15 talked of how kids like VIs, *"It's good. Especially for kids. VI is more easily reaching out to them compared to adults."*

4.2.4 Anonymity Affords Unfiltered Content and More Creators. Anonymity is a facet of VIs that is present across all VI types as not much is usually known about the people behind them. Some

VI followers from all three types of VI thought that this gave VI freedom to produce content with fewer restrictions. This was most commonly expressed by the participants following animated video streamers and non-humans. For example, anonymity gave VIs more credibility for speaking out in the eyes of P30: *"I think it's great, there's no face tied to it, so usually these people care about the issues they speak about rather than doing it for clout."* P29 felt as well that VIs could be more honest and speak their mind more freely on sensitive topics without facing hate or the fear of getting 'canceled'. Especially, animated human VIs were expected to be protected by anonymity and thus able to voice opinions more freely on sensitive topics without worrying about repercussions such as public hate. P25 said, *"I think that, if she would live in our world and she is up to date about things happening in our society, she would probably give an unfiltered and pure opinion because she is not a real person. She will be able to tell things a normal person wouldn't want to say... if you can use an AI to say things humans are going to get canceled for then why not... Social media is very toxic and people can be hated based on their opinion. Wouldn't it be great to use AI for sensitive topics?"*

The anonymity of VIs also protected creators from being swamped by fans and allowed shy individuals to create content. Being animated protected VIs from certain content restrictions on regular content. P21, who followed many VTubers, found VI to have some specific advantages because they could show content that was riskier than human influencers. *"Look no offense but the VTubers have got more content, humor, dirty jokes, and less likely to get banned from streaming sites coz of their body."* He also felt that the anonymity of VIs was powerful and gave creators more confidence and allowed them to be more "real" than if they showed their faces: *"Virtual influencers are the future ...Pokimane and SSSniperwolf they have to go out and get swamped by simps and fans alike ... Vtubers they are protected under their masks like...like superheroes... the world hides behind a mask every day. Humans lie through their smiles and eyes and tubers have the ability to be themselves behind a 2D anime girl. Melody is shy like, super shy so for her to use the ability of 2D waifu material. Why not? If it grants u confidence then, why not?"*

Some participants also perceived potential of having VIs to anonymise themselves on social media. For example, P30's own experience as a VTuber (non-VI) bears this out because he is not comfortable streaming with his face due to a specific physical feature, *"[Anonymity is] just something that comes with the times. I myself have a channel with over 500k subs and I haven't shown my face."* Becoming a VI is more accessible than to only those who are attractive and pretty. P13 said, *"you don't have to be pretty to be a Virtual Influencer, just smart and be a good storyteller."* P22 mentioned that Melody, the VTuber, would not have produced content if she were not anonymous as her personality is very different in real life. P16 was *"amazed that we possess technology where some random person online can produce content of this quality."*

4.2.5 Concerns and Worries. We noted concerns expressed about VIs among followers across different types of VIs, with mimic-real human VIs raising the most concerns.

Setting Unrealistic Beauty Expectations. Some of the participants were concerned that the very perfection of VIs might create problems in society. P5 left so: *"[I'm] intrigued and slightly worried. If these CGI-fake people-virtual influencers get THAT good and continue to improve, then people may start commissioning virtual influencers as models instead of real people, which already idealises and enforces unhealthy and borderline unachievable standards of beauty. How bad will that mentality get when we start comparing ourselves to fake people?"*... *"Humans are not perfect; digital CGI can be"* P7 expressed that VIs getting too good worried him, *"I'm intrigued. I wanna know more about them, but also kinda worried because who knows what we'll be able to create in a couple of years."* P29 also talked about how the very realistic persona of the VI *"scared him in the beginning"* and made him *"a bit nervous"* because *"they were the strangest thing ever and he did not know who or what they were"*. This made him initially hesitate before direct messaging the VI. However, this concern was

also expressed by P10 for animated human VI: *"Some have the ability to be manipulative since they are computer generated and are made to be inhumanly (sic) beautiful. Some vulnerable viewers have the potential to be exploited."*

Opacity Having Potential for Deception. The potential for manipulation could also exist due to the lack of transparency about the intentions of the actors behind the account. Such a concern was shared by P11 who follows a non-human VI: *"For example, an account can't support a cause against abortion or pro-gun or another cause and can give information for influence people but not qualify his remarks...When we are on the Sea Shepherd account, we know that it is a pro-environment association, but Bee Influencer is less clearly explained or highlighted when you just look at the account quickly. People don't know that the account tries to influence them."*

Similarly, P10 was wary of being deceived even though he was accepting of them in general: *"Virtual influencers are inherently actors and we need to know that. Even though we playact like they're AI or whatever they still have humans behind them. So if they want to talk about health and general human awareness it is fine. However, if they claim to know about racial or political issues specific to certain groups then I wouldn't appreciate it, since I don't know if I'm being gaslighted."* P1 remarked across similar lines, *"Some forms of activism are always good to see where the message is being spread but they should definitely stay out of anything controversial or definitely not give their opinion when it isn't needed as they aren't experts."* P6 did not consider VI espousal of causes genuine but he considered such behaviour normative for influencers, *"I feel like it's a normal path to take as an account on social media. I see VI as a company's Instagram. They'll post about what's trendy, so it's normal that they claim they're vegan and such... even though they don't eat because they do not exist."* P14 and P19 echoed these thoughts with P19 saying, *"It would of course affect my support of that account if the subject didn't align with my views."*

Another concern was attributed to the sudden disappearance of VI accounts. P2 expressed, *"VIs just vanish and we can only suppose and try to guess why, but human influencers give at least an explanation or a warning saying that they will take a break."* P7 and P12 were initially recruited for the interviews through their comments expressing concern about why the VI was not posting. P7 recalled asking *"where's Blawko been?"*

5 DISCUSSION

5.1 Opportunities for Virtual Influencers

5.1.1 Expectations Being Met by VIs. A survey of UK and North American consumers found that 82% of users use social media to get information about a brand [20] and their top content interests to be in 'influencer content', 'shopping content', and 'humorous content'. In this study, all participants were following multiple TIs and at least one VI. There is a desire for entertainment among followers that is often met through updates of the entertaining lives of influencers. The tiredness with TI content found in the study resonates with findings in a 2018 survey that listed 'influencer fatigue' setting in among followers even as demand for daily influencer content was strong [55]. A common refrain in our results is that followers felt TIs were fake or sellouts to advertisers and brands. There was a perception of influencers not being genuine and always trying to push products to them. This is in line with the prior work that found that brand encroachment into an influencer's content adversely impacts the perception of authenticity [5].

Therefore, this study shows that there is an opportunity for alternative content as the freshness of content and creativity were key draws with the same respondents who were concerned with stale content from TI. VIs have been able to engage their audience utilising a variety of content, e.g., music, art, artistic videos, pictures, graphics, funny posts, and a variety of other content released by VI. This supports the contention that VIs with artistic content are perceived as authentic [41]. These findings

cut across user themes of interest. Their creativity and storytelling resonate with social media users and serve as a contrast to TI content perceived as more boring. The findings also show that while endorsements are generally not viewed with enthusiasm, creativity in endorsements is viewed positively, with some consumers even enjoying them. For any commercial or non-commercial organisations trying to reach out to an audience, this is an important takeaway. VI content has characteristics that are attractive to their audience and so they can successfully engage with users who otherwise tired of influencer content. VIs should harness these positive connotations and maintain the traits that make audiences like them.

Our findings show that VIs exhibit a high degree of responsiveness with their followers. A high amount of responsiveness, pinned comments, or holding of contests are not unique to VI and could also be characteristics of TI. With VIs acting with greater responsiveness and interactivity than TIs, users built a more positive attitude towards them and also engaged more. Indeed, the literature on parasocial relationships shows how celebrities can have a deep effect on followers through relatively few interactions at their end [63]. However, the responses of the study participants indicate that responsiveness may be less common among TIs as the high responsiveness of VIs came as a refreshing contrast for them. This finding is our study resonates with that of a case study in which new followers of *Lil Miquela* and *Noonoori* appreciated how frequently the VIs posted updates and gave personalised responses to their comments bringing the followers closer and even making them feel like '*friends*', a feeling they had not experienced with TIs [38]. We suggest that influencers wishing for greater interaction and influence over audience actions should be more proactive and responsive to their audience. Furthermore, brands utilising influencer marketing could gain from the positive parasocial interactions that VI have with their followers.

5.1.2 VI as a Distant Being Existing in Another World. Prior research has shown that viewers of VTubers feel that there is a sense of distance between them and the VTuber avatars [34]. We observed a similar effect in our study and this perceived distance could partly explain why some participants said that they liked to forget about real persons being behind the account. The study aligns with the Hyperpersonal Model of CMC [59, 60]. The limited information that VIs tend to provide leads to speculation. This is evident in the intrigue, curiosity, and sense of mystery that our participants felt in this study and that has also been documented elsewhere in the literature [44]. The lack of cues leads to a greater interpretation of the limited appearance and persona cues provided by VIs and further increases their interaction with VIs. Even though participants knew that there were people behind the VIs, the findings indicate that the VIs are imagined to have an identity separate from their creators and that this has a positive interaction effect. Additionally, this separation that VIs created also made some participants comfortable in interaction because they could avoid potential social judgements from real humans. This suggests that future creators of VIs should continue limiting information release about those behind the VIs to maintain a degree of mystery and separation from creators. It is possible though that as VIs become more common, their "*mystery effect*" might become less effective.

A key finding in this study was that VIs are perceived to be existing in a different dimension from that of the observer, in an alternative form of reality, or as a blend of the virtual and the real. This results in curiosity, mystery, and intrigue and leads to sustained user engagement. Users enjoy the feeling of the virtual world and not being able to predict what is to happen. This serves as a nice contrast to the followers also complaining about the predictability of TIs. This thus shows that VIs have the potential to be an alternative for people who are tired of regular influencer content on social media and looking for alternatives. Virtual worlds are spaces where an alter ego or 3D representation of a person could exist with gaming worlds being a common example [37]. Even though curiosity about VIs was also noted in a previous VI study that participants among

inexperienced users [38], our findings show that VIs can maintain curiosity even among long-term followers. It had been hypothesised that it was the novelty that leads to follower engagement with a VI [27], but our findings suggest that the effects of curiosity on increased engagement last even in the long-term. It has been argued by Bittarello [7] that myths and religious texts were pre-internet virtual worlds conceived to be distinct from everyday reality. The content of VIs has fantasy elements common with both these conceptions of virtual worlds; as characters in mythology, as well as games, are known to have special performative abilities, it is a logical corollary that people have special expectations from VIs.

The results also indicate that VI are often put together in the same category as artificial intelligence, cybernetics, and other futuristic technology themes. This resonates with the expectations of experts in prior work [41]. These domains might be particularly suitable for VI applications. However, though the traits of VIs are seen to be different from that of TIs, the study found that some expectations from VIs are remarkably similar to those from TIs. Due to this reason, VIs are expected to be capable of facilitating change and even considered to have some responsibility for social good. Student researchers in Sweden who created a VI account found that 79% of impressions of posts were from non-followers which shows that the reach of VI posts is much more than just the base of followers [15]. Thus, health, environmental, social, political, or other such non-profit organisations could utilise VI for communication.

Our findings are in agreement with previous research indicating that posts showing emotions and showing interaction with other influencers or celebrities garner more likes and comments from followers [48]. By collaborating with TIs, the digital story worlds [9] collide with reality, hence the VIs prove their legitimacy in the digital media landscape and show their increasingly influential power among human followers. For TIs and the endorsed brands, they embrace VIs as a part of their work, delivering the message of being open, young, and trend-setting. We may conclude that this novel type of collaboration is a win-win situation for advertising and branding strategies. Mimic-real human VIs are more memorable for their viewers for their interactions with real-world persons and objects. This resonates with Molin's study [38] had found that *Miquela Sousa* with her humanlike features was more relatable to followers and led to more parasocial interaction than with *Noonoouri* who had a more doll-like appearance. However, *Noonoouri* is not a typical animated human and has an abnormally shaped head and eyes and this abnormality might be the reason for reduced comfort [47] as compared to *Miquela*.

5.1.3 Protection Enabled by VIs. The study shows that the persona of a VI and its inherent anonymity results in their audience having greater tolerance for unfiltered speech as compared to TI. Their appearing "*virtual*" and "*AI*" differentiate them from real-world individuals who could be scrutinised individually. As echoed in the interviews, the anonymity offered by virtual influencers lowers the entry threshold of being an influencer. It is a common observation that human influencers tend to be attractive. SMIs frequently face a lot of directed hate, including being shamed for their body appearance [12, 23]. This prevents many potential creators from acting as influencers and showcasing content. The phenomenon of VIs, therefore, democratises the landscape of SMIs by allowing new creators to enter with much lesser fear of personal scrutiny. For example, in a past study, student researchers were able to create a VI and gain followers while maintaining anonymity in a two month long experiment [15]. Moreover, anonymity enables the protection of the influencer from cyberbullying to some extent -- humans can use it as a cloak to express themselves more freely on controversial or sensitive topics.

Our findings indicate that VIs have direct application in the fashion industry. Mimic-real humans are attractive and their posts are visually pleasing to followers. Thus, there is scope for VI to be used as virtual models, in the manner of *Shudu*. The potential exists for animated humans too as

they too were found to be attractive by followers. Besides this, VI could have multiple applications that were suggested by participants in the study. VI could act as a replacement for child actors, who are vulnerable to exploitation. They could appeal to children and their intrinsic curiosity and mystery could be used in virtual education. They could involve creators who are not 'pretty' enough to be on camera. Indeed, the use of VIs has expanded from the endorsement of fashion products to eclectic topics such as healthcare, environmental protection, and other causes. With the control creators can have over virtual influencers, storylines can be created to maximise the match between the VI and the endorsed topics. In addition, virtual influencers can be used as an alternative to human influencers, who may get involved in scandals.

5.2 Challenges for Virtual Influencers

5.2.1 Limited Trust in VIs. While our findings agree with prior research that has shown the equivalence of virtual influencers in generating attitudinal and purchase-related behaviours among consumers [50], we also noted a lack of trust towards VI that is in line with previous studies [3, 11, 38]. Though fewer participants in our study had ever made a purchase due to the endorsement of VI as against TI, this could be explained easily by the presence of many more TI as compared to VI. As VI is a relatively recent phenomenon, the participants are also likely to have followed TI for much longer. The generally lower trust for VIs deserves more analysis. A review of the transcripts suggests explanations concerning the source credibility of virtual influencers.

Source credibility is one of the main factors of source effect, which suggests that evaluation of endorsed brand or product is influenced by the perceived attributes of the endorser [25]. Source credibility is composed of expertise and trustworthiness [35]. Expertise concerns the competency and knowledge of the source; trustworthiness concerns the apparent honesty and integrity. It has been found that when there is a match between the source, i.e., the endorser, and the product, the endorser generates positive effects, such as attitude and purchase behaviour [29]. For VIs, it is no hidden fact that they cannot truly experience tangible products, such as clothing or food, which harms the perceived expertise of VIs when they endorse such products. Hence, people are more reluctant to accept their endorsement. Rather, the findings show that they trust virtual influencers more if they endorse "*tech stuff*" because that is more in line with their area of supposed expertise. Meanwhile, the lack of authenticity of VIs deteriorates their trustworthiness. To most followers, the human teams behind a VI are unknown, which dampens the perception of authenticity as followers are unsure of the intention behind a VI's activities [3]. As a result, they are considered untrustworthy. This presents a challenge for VI creators and an opportunity for future research on how to overcome this lack of trust.

In our study, some participants indicated that they would not follow *any* influencers posting repetitive content or if they were too blatantly commercial. This suggests that VIs are neither beyond "*influencer fatigue*" [55] nor beyond issues of authenticity. VIs too would need to be careful about content quality and be transparent regarding their commercial interests as has been suggested for TIs [5]. This finding also supports the prior hypothesis made in a study [41] that VI content needs to have unique creative visions and strong storylines for long-term success. Our study furnishes evidence favouring Jauffret & Kastberg's [27] assertion that the stories concocted by *lilmiquela*'s team keep her followers guessing and engaged. In our findings, we found that The lack of clear information about VIs and its development made several participants research them to gain more information about them. They alluded to their uncertainty about the exact status of the VI account and this acted as a hook but also retained their interest.

However, some participants acting on VI endorsements did think of VIs as a front for their human team. This phenomenon demonstrates the complexity of trust issues to virtual influencers, who by themselves lack agency. It also calls into question the boundary of the Media Equation effect (for a

review, see [16]), or the nature of interaction with virtual influencers. That participants frequently displayed a clear awareness of the creators of the account should also be of interest to VI creators and investors. The Media Equation effect refers to the phenomenon where people interact with computers with minimal social cues with the same social responses as if they are humans [43]. In other words, the social behaviours elicited by a computer are towards the computer itself rather than the programmers behind it [17]. The hypothesis is well confirmed across studies. However, this is not what we observed in the study. There are several possible explanations. One concerns the longevity of the Media Equation effect [42]. Since this line of research tends to be one shot, it is yet to know whether the effect could last in long term. The participants interviewed have followed VIs for a relatively long period of time. Hence, it is likely that with increased interactions, users tend to ponder on the mechanism behind virtual influencers and realise the lack of agency of virtual influencers.

Meanwhile, it is noteworthy that the interaction between followers and VIs does not resemble entirely typical interactions in the Media Equation paradigm: the interaction with virtual influencers is indirect or delayed; hence, it more closely resembles parasocial relationships whereas the interactions in the CASA paradigm are normally direct. This may pose a boundary condition to the effect of CASA [43]. It is also possible that the findings are specific to the participants recruited. In sum, the attitudinal and behavioural effects of VIs are complicated by their lack of authenticity and agency attributes, which, however, contribute to their popularity to some extent.

5.2.2 Distortion of Reality. VIs cause some concerns even among their followers. Their advent causes uncertainty about a future in which virtual and physical beings share space and jostle for attention resulting in difficulty in distinguishing the virtual from the real. This represents confusion about the ontological nature of virtual influencers [27]. In addition, for mimic-real human VIs, viewers may experience the *Uncanny Valley*; the phenomenon describes the uneasiness people experience when perceiving an entity that looks almost perfectly humanlike [39]. However, our findings reveal instances when participants had been initially unclear about whether the account was of a real or artificial person and the digital rendering of the VI images had not caused them discomfort. Even participants who called some VIs' images too "real" still displayed a high level of engagement with the VIs. This indicates that there may be many individuals who are either unaffected or not very strongly affected by the Uncanny Valley Hypothesis. It could also be due to the relative absence of feature abnormalities that are known to specifically cause discomfort [47]. This bodes well for future designers of VIs who could make VIs even more realistic without worrying about making viewers uneasy.

A point of note is that the spookiness on viewing ultrarealistic CGI was not expressed by those following non-human and animated VI. Mimic-real human VIs also raise concerns over distorted beauty perceptions, because their form can be freely manipulated by designers. In contrast, non-human VIs do not evoke body image concerns. It is notable that our findings also show the possibility of animated humans seeming too attractive and thus competing with humans on beauty but this was noted much less than for mimic-real human VIs. Our findings support the prediction that viewers are more comfortable with animated human VIs [41]. They are also in agreement with the literature we had reviewed on the U-shaped relationship between likeability and realism [33, 46]. Non-human VIs may be more comfortable because they are perceived as less judgemental [4]. Our findings suggest that non-human VIs and animated human VIs are generally more comfortable for users, provided their human or animal likeness is low, and so in domain applications where comfort is of high importance, such as in education, we would suggest their use over more realistic looking VIs. Animated human VIs are particularly attractive as well. There is evidence that designers are

aware of this because among VIs especially involved in specialist causes such as environmental protection tended to be animated humans or non-human.

While VIs did prompt ontological questions among participants regarding their larger implications, the fact that participants displayed an understanding of the human element suggests that we cannot yet say that the VI phenomenon has caused a blurring of lines between reality and a digital simulation [14]. However, our findings show that VIs who are wholly digital beings are treated like flesh and blood influencers. Content is often more important than the exact medium of the content. This comfort with VIs is not unexpected and is in line with the Computers as Social Actors Paradigm [43]. High behavioural realism shown by VIs makes users treat them similarly to human influencers. This could be because our participants are mostly quite young (mean age = 22). VI followers are well-aware of the non-human, non-existential nature of virtual influencers. Nevertheless, our study shows that sometimes even aware followers forget that VIs have humans behind them and interact with them as if they are an independent entity. This is all the more interesting when considering that VIs were also sometimes called Artificial Intelligence (AI) influencers. Although this could be based on the erroneous assumption that VIs are fully autonomous beings, it might also be based on AI becoming synonymous with virtual. This has implications because the mere usage of the term "AI" biases users towards thinking of autonomous beings.

6 LIMITATIONS AND FUTURE WORKS

One of the limitations of this study resides in the use of email interviews and DMs. This was unavoidable given the fact that followers were spread out geographically and there was no feasible way to identify persons in a specific area. However, email interviews do not yield as many cues as face-to-face and telephone interviews and may act against participants who have difficulty responding in a written format [36]. DMs also have the same limitations. These modes also do not let us verify the credentials of the interviewees and so risked any deliberate misrepresentation.

Another limitation concerns our sample of participants. We deliberately chose participants for the study who demonstrated engagement with VIs through commenting behaviour. This might have excluded participants who interact often but not through comments. Furthermore, participants in our study were generally young and very conversant with social media and technology. It is unknown whether older or less experienced users might perceive VIs differently. We also limited our study to Instagram followers as our profiling revealed that to be the most popular platform for VIs. However, many VIs also had extensive activity on other platforms and user behaviour could vary by platform. Furthermore, even though we interviewed VI followers from 16 countries, our analysis did not take into account cultural background since we did not have sufficient depth of representation by country for an analysis by country. However, in cultures where virtual characters are pervasive, such as Japan, audience interaction and perception could be different. In addition, this research is limited to English. Although English is the most commonly used language by VIs, many VIs post in languages other than English. A related issue is that many of the study participants did not speak English as a native language. Though we made repeated efforts to clarify questions and answers, we cannot eliminate the possibility of some responses having been limited due to linguistic reasons. These limitations affect the degree to which our findings can be generalised. Future work should further consider more languages and country-specific VI applications.

Future research could use our findings on follower perspectives, especially those on effects of different types of VIs, along with literature on robotics and effects of human-likeness, to systematically manipulate the look of VIs and study the effects. Another interesting area could be future VIs that are powered by AI technology. The research could investigate whether VIs possessing a degree of agency are perceived differently from those fully curated by human teams.

We also found a significant percentage of VI accounts that were largely inactive or had been terminated within two years indicating that there was significant attrition among VIs. There could be several reasons for this, including VIs intentionally being short-term projects, them being too costly to run, creators experiencing burnout, or lack of popularity. For example, some posts by *Liv In the Future* and *Sylvia* mentioned themselves as projects and indicated discontinuity. Future research could investigate these reasons and also the perspective of VIs.

7 CONCLUSION

Virtual Influencers are a unique phenomenon sharing characteristics with fictional characters, digital avatars, and humanoid robots but their evolution raises questions that could only be answered by research specifically on VIs. However, owing to their novelty, there is a relative dearth of academic literature on VIs. Our study is the first to use the interview method to understand the perspective of long-term followers of VIs. It is also the first to cover different kinds of VIs based across the world, as previous literature mainly focused on mimic-real human VIs. The study yields rich insights into how online users interact with VIs on social media. For example, followers are often content-driven, looking for entertainment, and wary of fake brand promotion on social media. Some of them are unmindful of whether this is satisfied through humans or virtual entities. VIs evoke natural curiosity and retain followers due to engaging content that is story-driven and creative. They also exhibit a high degree of responsiveness which also endears them to their followers. Additionally, VIs that look very humanlike are more attractive to followers and it also indicates a low incidence of the Uncanny Valley effect indicating acceptance. Mimic-real humans are attractive to viewers too, sometimes even more so than humans; but this attractiveness acts like a double-edged sword because it also causes concerns including that of projecting an unrealistic body image. Though followers harbour a lack of trust for VIs due to their 'virtualness', they still trust the VIs in specific areas revolving around contexts where they believe VIs may have expertise. Therefore, animators, musicians, voice actors, digital artists have the potential to utilise this new medium to create digital content while advertising agencies have room to use VIs for digital marketing. Public interest organisations could potentially use VIs for endorsing causes for social good, spreading awareness, or for education, with the advantage that VIs may be judged less for sensitive topics than humans.

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