

Chinese Social Media Users' Perceptions of the Authenticity of AI-Generated Virtual Influencers

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Abstract: Virtual influencers have become a transformative force in the rapidly evolving social media landscape, redefining the dynamics of user interactions on Chinese social media platforms. The proliferation of virtual influencers on platforms like Instagram, Weibo, and TikTok, ranging from eerily realistic humanoids to captivating anime-inspired personas, signals a paradigm shift in audience engagement strategies. This study investigates the function of perceived authenticity in dictating user interaction intentions with virtual influencers and how different patterns of encounters with virtual influencers on social media—intentional/incidental—affect these interactions. Surveyed 156 respondents, the research highlights that virtual influencers with strong storytelling and human-like traits are perceived as more authentic, enhancing user trust and engagement. The study also emphasizes the need for tailored virtual influencers' interaction strategies.

Keywords: virtual influencers, perceived authenticity, social media, user engagement

1. Introduction

With the arrival of advanced artificial intelligence technology, the digital entity can imitate human influence, with audience interaction, and speak with humans strikingly similar brands [1]. These virtual influencers, ranging from hyper-realistic humanoids to anime-inspired characters, inhabit platforms like Instagram, Twitter, and Facebook, amassing significant followings and partnering with major brands. Their ability to generate content, interact with followers, and provide personalized recommendations mirrors the behaviors of human influencers, yet they offer unique advantages such as 24/7 availability, immunity to scandal, and customizable appearances and personalities [2].

As AI technologies have evolved, their impact on social media has spilt over into the field of social media influencers [3]. Research believes that virtual characters bring new channels to digital marketing [4]. Although virtual influencers are a relatively new image, they already have an influence on social media that cannot be underestimated [1]. In corporate advertising campaigns, virtual influencers are increasingly seen as substitutes for human influencers [5]. Lil Miquela, the first virtual influencer created in 2016, had made 1,337 posts and garnered more than 3 million followers on Instagram by 2024. She was once named one of the most influential people online [6]. Similarly, the sudden rise of "Liu Yexi" on TikTok in late 2021, accumulating millions of views and followers

within days, underscores the potential of virtual influencers to captivate audiences swiftly. Liu Yexi's rapid ascent across multiple Chinese social media platforms signifies a case of exceptional prominence amidst the saturation of short-form video content.

Nonetheless, it is a common finding that virtual influencers often elicit fewer positive responses despite higher interaction rates than its human counterparts. Arsenyan and Mirowska's work highlights the perceptual gap between virtual influencers and human influencers, as well as the perceived differences and humanness of virtual entities [7].

In conclusion, as virtual influencers integrate more deeply into media ecology, this inquiry aspires to furnish a refined comprehension of consumer reactions, furnishing insights to optimize virtual influencer deployment for augmented engagement, trust-building, and ultimately, catalyzing consumer behavior. This investigation delves into the function of perceived authenticity in dictating user interactions with virtual influencers and the complex interplay between intentional and incidental encounters with social media virtual influencers, hypothesizing that characteristics of perceived authenticity and social media exposure play a key role in shaping users' engagement.

2. Literature Review

2.1. Virtual Influencers

Despite the robust upward trend in virtual influencers' emergence on Chinese social media platforms, existing academic literature has given this phenomenon limited attention, particularly regarding in-depth explorations within the context of Chinese social media. Current research primarily focuses on virtual streamers and virtual idols, leaving “virtual influencers” as an under-explored subfield. Virtual streamers, acting as novel content creators in the live streaming arena, leverage motion capture technology to mirror the real-time actions and expressions of operators behind the scenes onto screen-based virtual personas, facilitating immediate interaction with online audiences in their digital domains [8]. This innovative mode of communication not only redefines the boundaries of what it means to be a “streamer” but also highlights how technology is reshaping the dynamics of human-media interaction.

In contrast, virtual idols are conceived within a broader and more mature framework of digital technology, typically embodying roles such as singers, actors, or idols, rendered through sophisticated computer graphics. They embody the vanguard of cultural production in the digital age and signify a transformation in traditional star-making mechanisms, heralding a deepening shift towards digitization and virtualization within the cultural industry [9].

Advancements in technology, which underpin the virtual digital human realm, are progressively shifting these entities from specialized niches toward popularization. Virtual influencers, as a pivotal branch of this progression, exhibit a diversifying array of operational strategies, content innovations, and commercial monetization models [10]. In this context, virtual influencers transcend mere entertainment functions, demonstrating unique value and potential in cultural expression, brand endorsement, and social interaction and serving as a new conduit bridging the digital and physical worlds.

Therefore, an in-depth analysis of the audience acceptance psychology of virtual influencers in China's social media environment and its impact on the traditional media ecology can not only enrich our understanding of the evolution of communication forms in the new media environment but also offer empirical evidence for predicting future trends of virtual digital people, which has important theoretical and practical significance.

With reference to the above literature, we define virtual influencers as computer-generated form images that play a similar role to human counterparts [11]. Virtual influencers view the world through a first-person perspective [12]. Much like real-life influencers, virtual influencers attract audiences

by producing content within their specialized fields and by expressing thoughts and emotions [13]. This enables them to amass a substantial following and wield the power to influence social media users.

2.2. Social Media Exposure

The way news, trends, and opinions are exposed has shifted significantly from traditional newspapers and magazines to the digital realm, which has triggered concerns and investigations in communication, psychology, and public health. Online social networks and advanced personalization algorithms have given individuals access to unprecedented amounts of information. The publishing and management of content has shifted from professional editors to individuals and is driven by social networks and algorithms. While these technological advances can expose users to a wider range of perspectives, they also have the potential to enable individuals, under preconceived information, to reject challenges to pre-existing views, which can lead to entrenched extreme attitudes and a distorted view of reality [14].

Current research on social media exposure reveals its complex effects on public mood and behavior. The way in which these media platforms are accessed is a key factor in influencing how individuals face and adopt new ideas or situations. Media exposure can enhance or mitigate people's perceptions of social threats and is also influenced by media content and user trust.

Social media is unique in its ability to generate incidental exposure, unlike intentional exposure, which is a key factor in gaining knowledge on a variety of social and political topics. Research has found that incidental contact with political information is positively correlated with users' engagement on social media [15]. The PINGS framework proposed suggests that while algorithmic filtering may limit the exposure of political content of all kinds, active search by users plays a more decisive role in the content push and the likelihood of presenting new perspectives [16]. Thus, in this personalized environment, news experiences on social media are often characterized by incidental news exposure (INE), where users are exposed to information about current events inadvertently or as a secondary activity to their primary mission [17,18].

When people look for different information, they may inadvertently come across the information they need. Fletcher and Nelson found that incidental news exposure exposed people to a wider range of online news information than those who did not, especially among younger age groups and those with lower initial levels of interest in the news [19]. Therefore, positive interactions with virtual influencers are inclined to reflect users' pre-levels of favorability and interest in these influencers, and thus show higher engagement. However, the effects of incidental exposure to virtual influencers are still under-explored and current research lacks consensus.

In summary, users' information acquisition channels on social media can be divided into intentional search and accidental contact, both playing crucial roles in shaping audience attitudes and behaviors and different channels may have different impacts on people's interaction intentions with virtual influencers.

2.3. Perceived Authenticity of Virtual Influencer

In contemporary society, people have different views on the authenticity of virtual influencers. Consumers' perceived authenticity of virtual influencers affects their trust and willingness to interact with these digital characters, where authenticity includes factors such as content transparency, sincerity, and the anthropomorphic qualities displayed by virtual influencers [20]. Traditional celebrities create value through the uniqueness of their content, while social media influencers create value through authenticity and connectivity [21]. For virtual influencers, the mechanism by which they express authenticity deserves further investigation.

The concept of authenticity is no longer simply defined as honesty. People's perceptions of authenticity continue evolving in different contexts, and the definitions of authenticity and inauthenticity also change accordingly [22]. Scholars generally believe that authenticity is both personally defined and socially constructed [23,24], and some believe it is an inherent objective attribute, while others believe it is a product of subjectivity [25,26]. Research shows that perceived authenticity includes multiple dimensions, including sincerity, visibility, professionalism, authentic recognition, and uniqueness, which all blend subjective and objective factors [27].

Consumers' perception of the authenticity characteristics of virtual influencers (such as expertise and sincerity) influences the relationship between their consumption behaviors (such as brand trust and purchase intention) [27]. When influencers are considered to have high authenticity, their endorsements tend to be more effective in generating trust in consumers and influencing their purchasing decisions. The role of perceived authenticity helps explain why some influencers are more successful in engaging with their audiences because authentic endorsements have a significant impact on followers [28].

For virtual influencers, strong storytelling skills and human-like features are essential to being seen as authentic [29]. The extent to which individuals connect with the character through parasocial interactions influences the impact of perceived authenticity. However, this perception seems fragile, and factors such as the uncanny valley effect (where near-human resemblance induces discomfort) can undermine consumers' trust [1]. Their psychological reactions during the interaction largely influence people's willingness to interact. The credibility of virtual influencers is a key aspect because some people are disturbed by their lack of transparency and obvious anthropomorphism [30]. Although some people believe that virtual influencers are real people, their credibility is still lower than that of human influencers [31].

Emotional factors are also important. Virtual influencers often strive to create emotional content to connect with users who are seeking an emotional escape or diversion from their daily lives [32]. However, users' emotional responses to virtual influencers may be different with research showing that negative emotions (such as anger) increase, especially when the number of virtual influencers increases [33].

Perceived authenticity significantly influences users' interaction intentions. With the growing trend of highly anthropomorphic virtual influencers, concerns have arisen about their impact on users' emotions [34,35]. Balancing virtual and human agents is crucial to maintaining authenticity without causing negative emotions in users [7]. Items assessing the perceived authenticity of virtual influencers typically include uniqueness, endorsement practices, branding, visibility, and sincerity [36]. These metrics encapsulate factors that contribute to the perceived authenticity in a digital landscape increasingly populated by virtual personas, underscoring the ongoing challenge of cultivating credible and emotionally resonant virtual identities.

3. Methodology

3.1. Survey Questionnaire

By studying the literature on social media influencers, we found that most of the academic community uses qualitative research, case analysis, and questionnaire surveys. However, our main research focus is on Chinese social media users' interaction willingness, and we also need to study Chinese netizens' social media exposure and their perceived authenticity of virtual influencers. In qualitative research, personal interviews and focus group discussions are frequently employed techniques for gathering data [37]. The sheer scope of our inquiry necessitates a dataset that can rigorously assess the intricate dynamics between social media exposure, perceived authenticity, and interactive intention of social media users. Given this requirement, qualitative research is not feasible. In addition, there is little

research on Chinese virtual influencers. Thus, the case analysis cannot support our research. Therefore, we elected to adopt a questionnaire survey strategy, a methodological choice that aligns with our ambitions and the dearth of existing research in our focal area.

We collected data through an online survey. The survey was conducted on June 26, 2024, and lasted for 12 days. 156 questionnaires were recovered and 156 were valid. The questionnaire survey collected quantitative data in a standardized manner that facilitates analysis of participants' willingness to engage. Before study participation, respondents were informed that the survey was entirely anonymous, and the results of the survey were for academic purposes only. Besides, the survey was voluntary, and respondents could freely withdraw at any time. After the respondents agreed to participate in the research, they completed the questionnaire consisting of five parts—basic information and related questions about their experience and interaction with virtual influencers.

The questionnaire was structured into four main segments. The initial segment served as a demographic census, collecting essential background information from participants to inform the research. The second section is about the participants' interactive experience with social media influencers, and its purpose is to explore the differences in people's behavior when facing real influencers and virtual influencers. The other two sections are the focus of this questionnaire survey, which are social media exposure and perceived authenticity.

Virtual influencers are a relatively new topic in China. We considered that participants might be unable to judge their interactive behavior and cognition of virtual influencers, for example, "What do you think about the authenticity of the content posted by virtual influencers?" In this case, we took a comparative approach to help participants make judgments. In the second section of the questionnaire, we asked participants about their views and willingness to interact with real influencers and then compared virtual influencers with real influencers. "What do you think is the difference in authenticity between the content posted by virtual bloggers and real bloggers?" We also attached pictures of Chinese virtual influencers for participants' reference.

3.2. Social Media Exposure (Intentional Exposure or Incidental Exposure)

Most extant research has assessed social media exposure in terms of intensity of use, typically operationalized as estimated frequency and duration [38] or the amount of time spent [27]. Importantly, these assessments do not consider other dimensions of social media use, such as Intentional Exposure or Incidental Exposure.

Focusing on different ways of social media exposure, this study will measure Intentional Exposure or Incidental

Intentional Exposure: Measure social media social media intentional exposure with 1 item that gauges the extent to which respondents actively seek out AI influencers on social media platforms through functionalities like retrieving influencers through search functions.

Incidental Exposure: This is measured with three items: probing into how frequently respondents come across AI influencers on social media unexpectedly or without active pursuit (feeds from algorithm recommendation (automatically popping up), Through hot list messages, and getting information by following influencers/celebrities).

3.3. Perceived Authenticity

Questions 21 to 30 are designed to probe into the multifaceted nature of interactions with virtual influencers, focusing on pivotal elements such as content authenticity, uniqueness, and the extent of user engagement.

These questions are strategically formulated to gauge the spectrum of responses pertaining to the audience's perception of authenticity within the content disseminated by virtual influencers and how

content authenticity affects the personal image of virtual influencers (Q21- Q24). The research also seeks to investigate the variances in interactions between virtual and their real-life counterparts (Q25, Q26), exploring the emotional and behavioral responses elicited by virtual influencer interactions and evaluating the perceived uniqueness and the comparison of authenticity between virtual and real influencers (Q27- Q30).

4. Findings

4.1. Demographics

Among the 156 respondents, 56.41% (n=88) were female, 41.03% (n=64) were male and 2.56%(n=4) were non-binary. Around 30.13% (n=47) of the respondents were under 18, approximately 39.74% (n=62) of the respondents were in 19-25, while 30.13% (n=47) were aged 26 years and above. Concerning educational background, 62.18% (n=97) hold a college degree or higher. Most of the sample reported that 45.51% (n=71) of people indicate that their monthly income level is below 5000 RMB and 88.46% (n=138) currently live in first- and second-tier cities. 35.9%(n=56) of them spent 3-5 hours on social media and 30.76% (n=48) of them spent over 7 hours. The most frequently used social media platforms are TikTok (69.9%), Xiaohongshu (52.6%), Bilibili (47.4%), Weibo (31.4%), and Kwai (15.4%). Their preferred content types on social media are entertainment (movies, TV dramas, celebrities, etc.)(69.9%), music (MV songs)(54.5%), news(52.6%), games(35.3%), sports and health(33.3%), food and cooking(32.1%), fashion and beauty(31.4%), and travel(30.4%).The survey results also showed that 69.87%(n=109)of the respondents have had substantial interaction with online influencers, including following, liking, commenting, sending DMs, etc., while 13.46% of participants have not followed online influencers but have an impression of their names and creations.

4.2. Results

The survey findings offer valuable insights into the nascent yet rapidly evolving landscape of Chinese social media virtual influencers. The survey results showed that 36.23%(n=50) of the respondents had had substantial interaction with virtual influencers, including following, liking, commenting, sending DMs, etc., suggesting a growing acceptance and integration of these digital personas within the social media ecosystem. While 41.3%(n=57) of participants have only browsed content related to virtual influencers, 19.87% (n=31)of users have never encountered virtual influencers, indicating the novelty and relative minority status of virtual influencers \and potential room for growth and wider adoption.

Our survey combines the role of social media exposure (Intentional Exposure or Incidental Exposure) in shaping audience perceptions. The majority of users (71.96%) primarily encounter them through incidental exposure (accidentally reaching out to AI Influencers on social media: feeds from algorithm recommendations automatically popping up; through hot list messages; getting information by following influencers/celebrities), emphasizing the pivotal role of algorithmic recommendations and trending content in shaping user encounters.

Despite the serendipitous nature of these encounters, a significant portion of users find the content of virtual influencers appealing, with 5.19% expressing strong interest, sparking interest in further interaction, and 62.34% acknowledging the freshness and intrigue, albeit without immediate intentions to deepen engagement. Meanwhile, 32.47% of participants are not interested in the content related to virtual influencers, do not intend to continue exploring, or even have some rejection. This suggests that while incidental exposure might not universally motivate deep interaction, it does lay the groundwork for initial curiosity and potential future engagement.

Although evidence cannot support that incidental exposure to virtual influencers excites users compared with intentional searches and participants may not necessarily be motivated to interact further when encountering virtual influencers by chance, data shows that a crucial differentiation point emerges when comparing virtual influencers to their human counterparts. 41.12% of participants believe that the content posted by virtual influencers is completely different in terms of authenticity compared to human influencers. And 42.99% of users believe there is some difference but not much. For the interaction between virtual influencers and fans, 38.32% of participants believe that the experiences are completely different from those with human influencers. In comparison, 45.79% of participants believe that there is a certain but insignificant difference between them.

The interaction quality between users and virtual influencers is much higher than that with human influencers. The key interaction elements between users and virtual influencers show that their interaction quality is better, such as content authenticity, uniqueness, and user engagement.

Over 41% of participants perceive a stark contrast in content authenticity, underlining the unique value proposition of virtual influencers. This is further echoed in the higher authenticity trust ratings, with 23.36% finding virtual influencer content authentic and trustworthy compared to just 3.62% for human influencers. Meanwhile, 34.78% of participants believe that the content posted by human influencers is not authentic and trustworthy, and 14.49% of participants believe it is not true or trustworthy. Regarding content posted by virtual influencers, only 22.43% of users believe their content is not authentic and trustworthy. In comparison, only 3.74% of users believe their content is untrue or trustworthy.

Similarly, uniqueness is significantly associated with virtual influencers, with a quarter of respondents recognizing their content as highly distinctive. When comparing content published by human influencers and virtual influencers, only 7.25% of participants believe that the content published by human influencers is unique, while 32.71% of participants believe that the content published by virtual influencers is very unique.

Notably, the emotional dynamics of user interactions differ. Despite the heightened perceived authenticity, users report encountering more negative emotions in these interactions, potentially pointing to the complexity of emotional engagement with digital entities that lack human-like empathy. There are many differences in the psychological and behavioral responses of users interacting with human and virtual influencers during social media usage. Compared to human influencers (29.75%), interactions with virtual influencers (37.01%) can be observed with more negative emotions, such as anger, anxiety, disappointment, nausea, depression, etc. And in terms of behaviors, it is less likely to give likes to virtual influencers' posts to show support or liking.

When deciding whether to follow a virtual influencer, participants believe that the most critical factors ranked in order are the authenticity and originality of the content (27.67%), the authenticity and attractiveness of the appearance design (24.76%), the popularity and influence of the virtual influencer (17.48%), the frequency and quality of interaction with other users (11.65%), the activity and update frequency on social media platforms (7.77%), etc. This underscores the centrality of content quality and aesthetic appeal in building a dedicated following.

Additionally, this proportion shows significant differences between male and female participants: male participants believe that the most important factor is the authenticity and originality of the content (32.91%), followed by the popularity and influence of the virtual influencer (22.75%), while the proportion of women who consider this indicator to be the most critical is 24.59% and 13.93%, respectively. The most important factor among female participants was the authenticity and attractiveness of the appearance design (27.05%), while this proportion was 20.25% among males. Gender disparities in preferences are evident, with males prioritizing content attributes more than females, who place greater emphasis on appearance design. These gaps illustrate the need to

customize strategies to match the characteristics of different audience segments in virtual influencer marketing.

Thus, virtual influencers remain a unique breed - not many of them exist currently, but those that do engage in high levels of authenticity and uniqueness. Given the dominance of incidental exposure and how content consistently outperforms the others signals that strategic leveraging of social media algorithms or creating more narrowcasted messages would likely help extend their reach even more to new audiences and deepen audience engagement. It requires a nuanced understanding of the relationship between exposure modes, perceived authenticity, and emotional responses to elucidate the impact they might have in digital environments.

4.3. Discussions

The finding that perceived authenticity is key to user engagement was further confirmed. Looking at how authenticity affected relationships, virtual influencers who were seen as authentic built greater trust and engagement. But it also showed that incidental exposure in isolation drives initial interest, not engaged over time. This more nuanced realization also reveals that unless the exposure is deliberate, it may not always be enough to engage users who do not see authenticity and emotional connection.

The partial alignment may also lead to the consideration of alternative theories. As virtual influencers approach the level of realness, the feeling of uncanniness may result in aversion and negative experiences, according to the “Uncanny Valley” theory. This theory may solve the question of why virtual influencers, displaying more authentic behaviors, often cause a lower level of positively charged emotions.

The “Algorithmic Serendipity” [39] shows that although algorithms may help users discover new content at random, this unintentional approach can limit deeper interactions, which calls out necessarily complementing algorithm interactions with user-driven activities in order to extract more meaningful interactions. Users, on the other hand, tend to be more drift and discovery-oriented - they still don’t engage directly through deep diving or active virtual influencer following. The incidental exposure results in initial intrigue but not necessarily ongoing interaction.

5. Conclusion

Most users discover virtual influencers through algorithmic recommendations or accounts that are frequently on the trends. However, it should be noted that many users are still fundamentally interested in virtual influencers. The fact that most users discover virtual influencers on algorithms or trending feeds suggests that most users stumble upon virtual influencers by accident rather than out of true interest. But many still express curiosity about the phenomenon, indicating they are open to interactions with virtual influencers. While a considerable segment of audiences is uninterested in or even skeptical of virtual influencers. This dichotomy suggests that perceived authenticity is an important factor for users to consider in shaping their interaction behaviors and trust. Virtual influencers with strong storytelling abilities and more human-like characteristics are more likely to be seen as influencers that users can interact with, thereby enhancing greater engagement and trust.

While virtual influencers are having some success, there is still room for improvement in regard to engagement strategies, emotional connection and perceived authenticity. Focusing on these areas can enable virtual influencers to solidify their standing and make stronger connections with the people that follow them.

5.1. Limitations

While the research provides some understanding on how Chinese social media users experience virtual influencers, this research does have some limitations.

The sample size was relatively small, with only 156 valid respondents - who may not be representative of the total social media users in China and so limit generalization. Second, because the data collection period was limited to just 12 days, exposure may underestimate how these interactions on social media have developed and changed over time for a particular influencer.

The concept of the word “authenticity” may be interpreted differently in Chinese and Western cultures. The social media landscape and user behavior can vary significantly between Chinese platforms and Western ones. Authenticity micros are evaluated differently in different contexts (e.g., content types, platform cultural norms and user expectations), which could imply a variance level of valuing authenticity of virtual influencers.

While the study mentions that emotional responses to virtual influencers were measured, it did not quantify the psychological processes underlying these interactions. Future research scholars may explore how diverse emotional reactions of virtual influencers affect user engagement and perceptions.

Each social media platform has its algorithm, user base and interaction process. There are other platform-specific factors that the study is not considering, which may also affect how users interact with virtual influencers.

5.2. Future Studies

The list of influencers continues to grow, with generative AI technology potentially playing a key role. Virtual influencers enhanced by generative networks have now emerged that do not look different from real influencers to the naked eye. These improvements have revolutionized the ability to create highly realistic digital personas capable of accurately mimicking actual human behaviors and appearances.

An additional important field of research is the influence of uncanny valley effect. Again, as the virtual influencers start to approach real life appearance due to AI technology controlling their “near” human-like features, this could become less comfortable for users too. Studying how this phenomenon impacts user trust and interaction with virtual influencers can help answer questions about how to design these digital personages for increased comfortability and user engagement.

Cross-cultural comparison is another frontier ripe for exploration. The comparison of the perceptions and interactions with virtual influencers between different cultural contexts will provide insights as to how authenticity and engagement are influenced by cultural factors. This realization can benefit in customizing digital promotions on influencers for a much more diversified viewers that may possibly support audiences way extra.

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