# Trust and Credibility of Virtual influence

# (Hyper-Realistic vs. Animated) Among Egyptian Youth

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**Abstract:**

This study investigates the perceptions of Egyptian youth toward virtual influencers (VIs), focusing on the interplay between anthropomorphism (hyper-realistic vs. animated designs) and key dimensions of trust, authenticity, relatability, and engagement. Grounded in the Uncanny Valley Theory and the CASA Paradigm, the research examines whether human-like qualities—such as emotions and social cues—enhance credibility or trigger discomfort. A survey methodology was employed, comparing two prominent VIs: the hyper-realistic Maquila and the cartoonish Noonoouri. Results revealed a slight preference for hyper-realistic VIs, yet perceived human-like traits did not significantly influence trust or engagement. Instead, cultural context and transparency emerged as critical factors shaping acceptance. The findings challenge assumptions about anthropomorphism's universal appeal, suggesting that Egyptian youth prioritize authenticity and clarity over realism. Notably, skepticism toward VIs persisted, with low overall trust scores, underscoring the need for ethical transparency in VI marketing. The study contributes to global VI literature by highlighting regional nuances in consumer behavior, particularly in developing markets where cultural and religious values may mediate technology adoption. Practical implications for marketers include tailoring VI campaigns to local sensibilities and emphasizing transparency to mitigate distrust. Future research should explore cross-cultural comparisons and longitudinal shifts in VI perceptions as digital landscapes evolve.

**Key words**: Virtual Influencers – Uncanny Valley theory – CASA Paradigm – Egyptian Youth

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# الثقة والمصداقية للمؤثرين الافتراضيين (المؤثرون شديدو الواقعية مقابل المؤثرين الكرتونيين) بين الشباب المصري

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**الملخص:**
استهدفت هذه الدراسة قياس اتجاهات الشباب المصري تجاه المؤثرين الافتراضيين (VIs)مع التركيز على التفاعل بين التأنسن (التصميمات شديدة الواقعية مقابل الرسوم المتحركة) والأبعاد الرئيسية للثقة، والأصالة، والقابلية للارتباط، والمشاركة. تستند الدراسة إلى نظرية الوادي الغريب (Uncanny Valley Theory) ونموذجCASA ، حيث تبحث فيما إذا كانت الصفات الشبيهة بالبشر - مثل المشاعر والإشارات الاجتماعية - تعزز المصداقية أو تثير الشعور بعدم الارتياح.

تم استخدام المنهج المسحي لمقارنة مؤثرين افتراضيين بارزين: ماكيلا (ذو المظهر شديد الواقعية) ونونووري (ذو الطابع الكرتوني). كشفت النتائج تفضيلًا طفيفًا للمؤثرين شديدي الواقعية، إلا أن السمات الشبيهة بالبشر لم تؤثر بشكل كبير على الثقة أو المشاركة. بدلاً من ذلك، برز السياق الثقافي والشفافية كعوامل أساسية في تشكيل القبول.

أظهرت النتائج اختلاف عن الافتراضات حول الجاذبية العالمية للتأنسن، مما يشير إلى أن الشباب المصري يفضلون الأصالة والوضوح على الواقعية. كما تمت الملاحظة أن درجات الثقة تجاه المؤثرين الافتراضيين كانت منخفضة بشكل عام، مما يؤكد الحاجة إلى الشفافية الأخلاقية في تسويق المؤثرين الافتراضيين.

تساهم الدراسة في الأدبيات العالمية حول المؤثرين الافتراضيين من خلال تسليط الضوء على الفروق الإقليمية في سلوك المستهلك، خاصة في الأسواق النامية حيث قد تلعب القيم الثقافية والدينية دورًا وسيطًا في تبني التكنولوجيا. تشمل التطبيقات العملية للمسوقين تخصيص حملات المؤثرين الافتراضيين لتناسب الحساسيات المحلية وتعزيز الشفافية لتقليل عدم الثقة.

**الكلمات الأفتتاحية** :المؤثرون الافتراضيون - نظرية الوادي الغريب - نموذج CASA (الكمبيوتر كوكيل اجتماعي) - الشباب المصري

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## Introduction

In April 2024, the first world "Miss AI" beauty pageant was announced. The pageant is organized by The Fanvue World AI Creator Awards (WAICAs) and is targeting AI- generated images and influencers, as artificial "humans", amongst controversial opinions about it (Mouriquand, 2024; Mahdawi, 2024). The direct concern of the critiques is setting more unrealistic beauty standards for young girls and females in general(Mahdawi, 2024), but this has to lead to the bigger question of to what extent are "real" humans willing to consider computer generated images as "humans"?

According to Cambridge dictionary, the word influencer refers to anyone who has the power to affect the opinions or actions of others(Influencer, 2024). The use of influencers in marketing isn't a new trend, but rather a very old one, where celebrities and athletes were used. With the rise of social media, regular people had the opportunity to live stream their lives and upload videos about what they do and what they think about for everyone to see. This lead to building a loyal group of followers to these ordinary people who were able to promote and make a product out of themselves(Wilkens, 2023; Nambakhsh, 2023).

Social influencer market started around the year 2007. It's estimated that there is 64 million social media influencer around the world(Andrii, 2023). And according to The Influencer Marketing Hub most recent survey, an overwhelming 85% of marketers acknowledge the effectiveness of influencer marketing, indicating a growing consensus on its value within marketing strategies and it's projected that the influencer marketing industry will reach a staggering $24 billion by the end of 2024, signifying its significant growth(Geyser, 2024; Dencheva, 2024).

Research suggests a significant disparity in the influence of celebrity endorsements compared to influencer marketing on in-store purchasing decisions. While celebrity endorsements sway only 3% of consumers, influencers hold considerably more sway, influencing 60% of consumers. This highlights the growing effectiveness of

influencer marketing(20 Surprising Influencer Marketing Statistics, 2021).

The Asia Pacific region is projected to exhibit the fastest compound annual growth rate (CAGR) until the year 2030 (MarkWide Resarch Report, 2024; Market Analysis Reprot, 2023). This anticipated surge is attributed to several factors: a high demand for innovative marketing strategies, a burgeoning population, and a rapidly increasing adoption of social media platforms(MarkWide Resarch Report, 2024). According to Statista, China is expected to lead global advertising expenditure, with an estimated US$19.16 billion(Influencer Advertising - Egypt, 2024).

Despite Facebook's established dominance, YouTube presents a significant challenge, particularly in its capacity to generate wealth for content creators. YouTube has demonstrably transformed ordinary individuals into celebrities and influential figures. Notably, YouTube fosters inclusivity, enabling the rise of fame across various age groups and demographics. This inherent diversity of content caters to a broad audience, attracting the attention of marketers who are increasingly allocating budget towards influencer marketing campaigns on the platform(20 Surprising Influencer Marketing Statistics, 2021).

In Egypt, the Influencer Advertising market is anticipated to reach US$36.8 billion in total spending in 2024(Influencer Advertising - Egypt, 2024). There are currently now about two influencer for each thousand citizen in Egypt, which make them more than one hundred thousand influencer(Andrii, 2023). And with all the advancement of technologies and the increasing demand for more influencers, virtual influencers were introduced.

The concept of virtual influencers can be traced back to 2003, with the introduction of Lu Do Magalu in Brazil. Designed as a virtual mascot for local e-commerce websites, Lu Do Magalu's presence extended to a dedicated YouTube channel launched in 2009. This early example has garnered a significant social media following, currently exceeding 30 million across various platforms) GryNow Influencer Marketing, 2024). The year 2016 witnessed the introduction of Lil Miquela,

widely recognized as the inaugural hyper realistic artificial intelligence influencer. Her debut sparked substantial debate regarding the authenticity of her persona, with many questioning whether she was a real person(AI Influencers: What They Are And How To Use Them, 2024).

The global VI market reached an estimated value of USD 3.60 billion in 2022. Projections indicate a substantial compound annual growth rate (CAGR) of 38.9% from 2023 to 2030(Market Analysis Reprot, 2023). Countries like Japan and China are at the forefront of the VI trend. Furthermore, the growing incorporation of VIs within marketing campaigns by brands across the region presents significant growth opportunities for the Asia Pacific VI market(Market Analysis Reprot, 2023).

From a report published by Dream Farm Agency and Statistaon a study made in the US in March 2023, Youths aged 18-24 demonstrate a strong affinity for VIs, with 75% following at least one. This receptiveness translates to purchasing behavior, as 40% of this group report buying products or services promoted by a VI. The appeal of VIs appears to diminish with age. Only 26% of consumers aged 55+ follow a VI, with a further decline in purchase behavior (18%)(Ansari, 2024; Dencheva, 2024). Moreover, VI campaigns boast significantly higher engagement rates compared to real influencer campaigns. In 2023, the average VI campaign engagement rate was 5.9%, which is three times higher than the average for real influencers (1.9%)(Ansari, 2024; Dencheva, 2024).

## Human Influencers vs. Virtual Influencers

Virtual influencers are computer generated characters, that could be human like or animated. These VIs could be created and handled by freelancers, digital agencies or specific brands(Koles, Audrezet, Moulard, Ameen, & McKenna, 2024). Virtual influencers (VIs) and human influencers (HIs) serve similar purposes as product promoters, but people perceive them differently(Byun & Ahn, 2023). Several factors contribute to VI market expansion like the ever-evolving digital landscape and the concurrent global surge in social media

usage are key drivers) MarkWide Resarch Report, 2024; Market Analysis Reprot, 2023). It can be said that VIs can be as effective, or even more so, than human influencers (HIs) in areas like content creation, media planning, and social media engagement(Byun & Ahn, 2023).

North America captured the largest market share, exceeding 44% in 2022(Market Analysis Reprot, 2023). This dominance can be attributed to the presence of several popular social media platforms within the region. Additionally, companies from diverse industries, including entertainment, fashion, and beauty, are increasingly integrating VIs into their marketing strategies. Examples of prominent North American VIs include Lil Miquela (U.S.) and Avery (Canada)(MarkWide Resarch Report, 2024; Market Analysis Reprot, 2023). The rising significance of social media among consumers, coupled with the growing focus of brands on innovative customer targeting methods, is expected to propel further market growth in North America) Market Analysis Reprot, 2023).

The main question that virtual influencers impose is their "authenticity". For a non-real entity how can VIs be authentic. There are three types of authenticity. The first is True-to-Ideal (TTI), which refers to a consumer's perception of how well an entity (brand, person, etc.) aligns with a socially determined standard. These standards are created by society and can change over time. For example, a consumer might perceive a clothing brand as TTI if its style aligns with what's currently considered trendy or fashionable. The second type is True-to-Fact (TTF), which refers to a consumer's perception of how well an entity represents reality. Think of it as factual accuracy. For instance, a news outlet would ideally be perceived as TTF by presenting information that is accurate and unbiased. The third one is True-to-Self (TTS), which refers to a consumer's perception of how well an entity's behavior aligns with its intrinsic motivations, rather than external pressures. In simpler terms, it's about being genuine and acting in accordance with your core values. For example, a musician might be perceived as TTS if their music feels true to their personal

style and beliefs(Koles, Audrezet, Moulard, Ameen, & McKenna, 2024).

One research concluded that VIs can haveTrue-to-Fact (TTF) authenticity. Although they themselves can't be truly "real" because they are not human, it's important for VI creators to be transparent about this. On the other hand, if VIs look very human-like but their virtual nature isn't disclosed, it can lead to distrust (Koles, Audrezet, Moulard, Ameen, & McKenna, 2024). This is also true with promoting utilitarian products, when the focus is on the practicality and usefulness of the product) Dondapati & Dehury, 2024).

As for True-to-Ideal (TTI) Authenticity, there are three possible ideals; (1) TTI Human: Looks and acts human-like, with some flaws, (2) TTI Virtual Entity: Doesn't need human characteristics, can have unique virtual features, and (3) TTI Character: Stays consistent with its own backstory and personality. VIs can be more TTI authentic by aligning with one of these ideals) Koles, Audrezet, Moulard, Ameen, & McKenna, 2024). Achieving this authenticity could lead to an increase in the effectiveness of VIs since the consumers would feel similar to the influencer or feel a close connection to them (Dondapati & Dehury, 2024).

And lastly the True-to-Self (TTS) Authenticity is not related to the VI character itself but rather to the creator of the VI. Consumers seem to value creators who are passionate and enthusiastic about VI technology. If creators seem focused on profit or chasing trends, it can make the VI seem less authentic and the more people are involved in creating a VI, the less autonomous it seems) Koles, Audrezet, Moulard, Ameen, & McKenna, 2024).

The world of advertising is being reshaped by computer-generated influencers. Brands are increasingly choosing virtual influencers over real people to promote their products for several reasons, like having more control over the influencer's image and saving money) Byun & Ahn, 2023; Franke, Groeppel-Klein, & Muller, 2023). The proliferation of VIs empowers brands with a greater degree of creative freedom within their marketing campaigns) Market Analysis Reprot,

2023), as they can be “adaptable, versatile and consistent”(Franke, Groeppel-Klein, & Muller, 2023). They are adaptable since they can be easily tailored to different audiences, making them suitable for any country or market) Franke, Groeppel-Klein, & Muller, 2023). In addition, they can even take on various forms, like human-like characters, animals, or 2D/3D animations, which makes them versatile to fit different campaigns) Byun & Ahn, 2023; Franke, Groeppel-Klein, & Muller, 2023). VIs can maintain a steady level of activity and engagement, consistently promoting the company in a positive light (Huang, 2023; Byun & Ahn, 2023) and they are active 24 hours a day(MarkWide Resarch Report, 2024). However, there's not much research on how effective virtual influencers are in achieving marketing goals) Franke, Groeppel-Klein, & Muller, 2023).

Virtual influencers present a fresh face in a very saturated field of ordinary human influencers) Gerlich, 2023; Franke, Groeppel-Klein, & Muller, 2023), especially if they are considered innovative or singular) Brigitta & Alexander , 2023), but they are still viewed as less trustworthy or credible than human virtual influencers) Byun & Ahn, 2023; Brigitta & Alexander , 2023) and they illicit less engagment than humna influencers(Looi & Kahlor, 2024).

There is no denying the advantages of virtual influencers, for example they won’t age, get sick, or be caught in a lie of using another product different than the one they endorse(Huang, 2023; Arunchoknumlap, 2023). At the same time, virtual influencers with higher cultural intelligence, particularly metacognitive and behavioral aspects, are seen as more credible by consumers (Hübner, Thalmann, & Schmidt, 2024). On the other hand, they don’t actually use these products (Rossi & Rivetti, 2023).

Research found that when there's a good fit between the virtual influencer and the product category, the advertising is more effective (Kong & Fang, 2024), for example, VIs maybe more effective in endorsing technical products rather than skin products (Franke, Groeppel-Klein, & Muller, 2023; Brigitta & Alexander , 2023; Shi, 2023). Although research show that the fashion & lifestyle segment could use successfully VIs in launching new products(Al Masri,

Hamadneh, Al-Dmour, & AL-Okaijly, 2023), and this segment held the highest revenue share in the virtual influencers market, exceeding 34% in 2022, and is projected to maintain its dominant position until the year 2030(Market Analysis Reprot, 2023). Brands in these sectors find VIs particularly attractive for promoting a wide range of products, including clothing, accessories, footwear, cosmetics, and wallets) MarkWide Resarch Report, 2024; Market Analysis Reprot, 2023)

While misusing the VI by promoting the wrong type of products might lead to reducing their impact on consumers, there are some indications that VIs can also be used successfully in the fields of tourism, health-care, and fashion) Jhawar, Kumar, & Varshney, 2023).Surprisingly, there are reports that the food & entertainment segment is anticipated to experience the fastest compound annual growth rate (CAGR) from 2023 to 2030. Furthermore, VIs are utilized within the entertainment industry to generate excitement for new projects and events, such as television shows, movies, and music. This trend is expected to present significant growth opportunities for VIs in the food & entertainment segment in the coming years(Market Analysis Reprot, 2023). Moreover, VIs can be used to boast brand image and trust for these types of products) Bouvier & Cho, 2022).

Also, VIs have the problems of transparency and poor design. For example, if companies don't clearly disclose that their influencers are computer-generated (Byun & Ahn, 2023; Huang, 2023), it can damage consumer trust and a poorly designed VI can lead to negative reactions from consumers (Huang, 2023). Consumers tend to trust “The word-of-machine”, which is a belief that AI recommenders possess superior competence in utilitarian contexts that focus on practicality and usefulness. Conversely, human recommenders are perceived as more competent in hedonic contexts that focus on pleasure and emotional connection (Longoni & Cian, 2020).

Followers might have mixed feelings about VIs.On one hand, they might be confused when a VI's social media posts look so real it's hard to tell them apart from a human influencer(Byun & Ahn, 2023) and many still tend to have more positive feelings towards human

endorsements(Franke, Groeppel-Klein, & Muller, 2023). On the other hand, they might be drawn in by the VI's unique appearance or personality (Byun & Ahn, 2023) and how they can make ads seem more original and new(Franke, Groeppel-Klein, & Muller, 2023).

In the era of digital media and rapid advancements in artificial intelligence, virtual or AI influencers have emerged as key players in shaping consumer behavior. Over the past few years, these influencers have gained significant popularity, with major international brands leveraging them to promote sustainability and eco-friendly products. As consumer demand grows, brands are increasingly turning to influencers—both human and virtual—to communicate their values. This intersection of virtual influencers and influencer-message congruence and source credibility play critical roles in driving consumer engagement and purchase intentions) Mennatallah, 2025).

## Hyper realistic vs. animated VIs

There are two main types of virtual influencers in the market, hyper-realistic VIs and animated VIs. Hyper-realistic are human like and realistic, while animated are more of cartoon characters or have cartoonish characteristics. There is a lot of conflicting results on whether hyper-realistic or animated virtual influencers are more effective or liked. That’s why, VIs can strategically use appearance, communication style, and emotional expression to cultivate a desired image and foster user engagement) Ju, Kim, & Im, 2024).

The non-human type or animated avatarssegment is expected to register the fastest CAGR of over 40% over the forecast period (MarkWide Resarch Report, 2024). The emergence and popularity of non-human avatars is driving this growth. Their limitless and unique designs capture attention in the crowded online space, allowing brands to differentiate themselves and forge a distinctive identity.Moreover, the flexibility and adaptability of non-human avatars make them suitable for various marketing campaigns, which is fueling the segment growth(MarkWide Resarch Report, 2024; Market Analysis Reprot, 2023).

The animated VIs segment is anticipated to experience the most rapid growth, exceeding a 40% compound annual growth rate (CAGR) until the year 2030. The emergence and widespread popularity of non-human avatars are key drivers. These avatars' unique and boundless designs allow brands to stand out in the saturated online environment, fostering a distinct brand identity. Additionally, the adaptability and flexibility of non-human avatars make them suitable for a wide range of marketing campaigns, further propelling segment growth(Market Analysis Reprot, 2023).

VIs with less human-like features displayed a wider range of emotions, primarily positive ones. This aligns with research on the importance of emotions in human interactions. Anthropomorphism, or the attribution of human characteristics to VIs, is hypothesized to directly influence how consumers stereotype VIs. This stereotyping is theorized to occur along two key dimensions: competence and warmth. The perceived warmth is a more significant factor than perceived competence when it comes to consumer willingness to follow a VI's recommendations(El Hedhli, Zourrig, Al Khateeb, & Alnawas, 2023). Also, although negative emotions were rare, potentially to maintain a positive image and engagement, a limited amount of negativity might actually attract attention(Ju, Kim, & Im, 2024).

Despite projected growth in the non-human segment, human avatars held the dominant market share in 2022, exceeding 68%. This dominance can be attributed to the increasing demand for VIs that are more realistic and relatable. Human avatars possess the capability to connect with consumers on an emotional level. Furthermore, the utilization of Artificial Intelligence (AI) to create increasingly realistic and lifelike human avatars is anticipated to fuel segment growth within the forecast period) Market Analysis Reprot, 2023). Moreover, hyper-realistic VIs or Human-like virtual influencers gets more engagement from consumers (Ju, Kim, & Im, 2024; Byun & Ahn, 2023), possibly due to a perceived sense of closeness) Liu, Aw, Tan, & Ooi, 2023). Again, Non-brand-operated VIs garnered higher

engagement, potentially due to a perception of greater authenticity) Ju, Kim, & Im, 2024).

A very important aspect in the Human Virtual Influencers HVI vs. Animated Virtual Influencers AVI is the transparency. Ads featuring human-like virtual influencers (HVIs) are seen as more believable and have a more positive impact on viewers than ads with cartoon-like virtual influencers (AVIs) (Byun & Ahn, 2023; Kim, Kim, E, &Shoenberger, 2023). However, this advantage of HVIs disappears when it's revealed that they are promoting a product. Interestingly, the positive influence of believing the ad message is real (message credibility) only matters when the sponsorship is hidden) Kim, Kim, E, & Shoenberger, 2023).

This suggests that people's reactions to VIs can be inconsistent. They might initially react positively to the familiar feel of the social media content, but then feel a sense of contradiction or cognitive dissonance because they're feeling familiar with something that isn't real(Rossi & Rivetti, 2023). This dissonance might then lessen the initial positive reaction(Byun & Ahn, 2023). Although this effect lessens with the younger-aged consumers, who are more willing to accept this new technology and interact with it (Dondapati & Dehury, 2024; Rossi & Rivetti, 2023; Market Analysis Reprot, 2023), since most animated VIs already target younger age groups(Huang, 2023). Also, the VI's character and backstory play a very big role in sustaining communication and increasing acceptability with consumers) Ju, Kim, & Im, 2024).

Moreover, the operator type and communication plays a very important role in VIs credibility. People don’t trust VIs because their sole purpose is to subtly influence them by undisclosed actors with a primary focus on product promotion) Rossi & Rivetti, 2023). Non-brand-operated VIs, similar to human social media influencers, expressed a broader range of emotions compared to brand-operated ones. Brand-operated VIs used primarily positive emotions with lower intensity, reflecting typical corporate social media communication. Also, research found that non-brand VIs used "we" more (building community), while brand VIs favored "you" (directing messages to

consumers), which makes the engagement with non-brand VIs more than with branded ones(Ju, Kim, & Im, 2024). This indicates that it might be more effective for brands to collaborate with free lancers rather than creating their own branded VI(Shen, 2024).

Another very important aspect related to the effectiveness of virtual influencers is their characteristics, like being hyper-realistic or animated, expressing feelings, attractiveness, and perceived trustworthiness (Kong & Fang, 2024; Ju, Kim, &Im, 2024). Research shows that the most effective characteristic on the VI credibility is their attractiveness) Kong & Fang, 2024). Surprisingly, the attractiveness of VIs isn't related to their type of appearance, whether they are hyper-realistic or animated) Ju, Kim, & Im, 2024).

Above all that there is the question of ethical concerns. VIs' ability to influence raises ethical questions. Their artificial nature might make them enablers of unethical marketing practices) Byun & Ahn, 2023).

## Uncanny Valley Theory and CASA Paradigm

The field of virtual influencers is a recent area of scholarly inquiry, yet it has garnered significant attention in the past few years. While prior research has employed a diverse range of theoretical frameworks, the resulting findings have been somewhat inconsistent (Angmo, Mahajan, & Oliveira, 2024). This inconsistency highlights the need for further studies that integrate multiple theoretical lenses to achieve a more nuanced understanding of consumer attitudes towards virtual influencers. In response to this gap, the present study aims to explore how three of the most prominent theoretical frameworks can be utilized to illuminate the attitudes of Egyptian consumers specifically.

The concept of the uncanny valley posits a curvilinear relationship between an object's anthropomorphism, human like traits, and an observer's affinity towards it. First proposed by Masahiro Mori in a 1970 essay, the hypothesis suggests an initial increase in positive sentiment as an object's design approaches human likeness. However, this trend reverses at a critical juncture, with near-human resemblance triggering feelings of eeriness or the "uncanny"(Kendall, 2024).This

perception of “creepiness” triggers negative sentiment towards VIs, especially Hyper-realistic virtual influencers) Gutuleac, Baima, Rizzo, & Bresciani, 2024; Penttinen, Mouritze, & Tranholm, 2023).Affinity then resumes an upward trajectory upon achieving veridical human representation, signifying a living person. This characteristic dip in affinity due to the uncanny effect creates a metaphorical "valley" within the overall association with the object) Kendall, 2024). This feeling is attributed to the uneasiness of humans to think of human like robots as beings that can “feel” but not when they think of them as beings that can “do) ”Gray & Wegner, 2012). Consumers fell more threatened when they perceive human-like VIs as a threat to their identities) Jin & Viswanathan, 2024).

There is some research that challenges that idea in the context of virtual influencers (VIs). One of these challenges to the Uncanny Valley theory notion is the assumption of a single ideal - perfect human likeness by suggesting there might be multiple ideals for VIs, like human-like, virtual entity (unique non-human features)(Koles, Audrezet, Moulard, Ameen, & McKenna, 2024), and a well-developed persona(Byun & Ahn, 2023) or a character (consistent with its backstory)(Koles, Audrezet, Moulard, Ameen, & McKenna, 2024). Also, as mentioned before, if the VI expresses emotions or uses social cues, the uncanny effect decreases) Gutuleac, Baima, Rizzo, & Bresciani, 2024).

Another challenging point is positive association with different ideals, which suggests that people might actually have a positive association with VIs that align with any of these ideals) Jin & Viswanathan, 2024), not just perfect human likeness. The last challenge to the theory is the issue of transparency, which suggests that the creepiness associated with very human-like VIs in the Uncanny Valley might be due to a lack of transparency) Koles, Audrezet, Moulard, Ameen, & McKenna, 2024). If people are unsure if a VI is real and it seems too perfect, it can be unsettling. Disclosing that a VI is not real can help avoid this) Byun & Ahn, 2023).

So, people might react positively to VIs that fit different ideals, as long as there's transparency about their virtual nature) Koles,

Audrezet, Moulard, Ameen, & McKenna, 2024). This could explain why Social media users with high trait reactance, the dispositional tendency to perceive situations as threats to freedom, actually showed the highest level of compliance with VIs that were perceived as less eerie(Jin S. V., 2023).

The last notion could be related to another theoretical concept, which is CASA Paradigm (Computer-As-Social-Agents). The CASA framework finds its origins in the seminal work of Reeves and Nass (1996), where they proposed that human cognition, particularly the "old brain," lacks an evolved mechanism to differentiate between mediated representations and real-world counterparts. When such representations closely resemble real-life experiences, humans respond instinctively and with minimal cognitive effort) Reeves & Nass, 1996; Gambino, Fox, & Ratan, 2020). This effortless response extends to social interactions. Consequently, individuals attribute personality traits, apply social norms and stereotypes, and draw inferences about media figures as if they were human, even while acknowledging their non-human nature) Gambino, Fox, & Ratan, 2020).

One study investigating the interplay between perceived humanness of virtual influencers and consumer attitudes found that a higher perceived degree of humanness in virtual influencers leads to a concurrent increase in perceptions of eeriness, attractiveness, and authenticity) Jang, Jin, Bright, & Wilcox, 2023). Another concluded that emotional display of feelings like happiness, sadness; surprise, etc., increase consumers' engagement with virtual influencers) Yu, Dickinger, So, & Egger, 2024). Furthermore, the enhanced perceptions of attractiveness and authenticity mediate the relationship between perceived humanness and positive attitudes towards virtual influencers and purchase intentions for advertised products. Additionally, the study revealed a moderating effect of perceived similarity between consumers and virtual influencers on these relationships) Jang, Jin, Bright, & Wilcox, 2023).

The CASA paradigm has recently attracted some critique, primarily centered on the need to incorporate the significant advancements in

technology witnessed over the past two decades) Gambino, Fox, & Ratan, 2020). Critics argue that the framework's core assumption of technology-naive users is no longer universally applicable. As technology has become increasingly integrated into daily life, users have developed a greater degree of awareness and intentionality in their interactions (Gambino et al., 2020). Furthermore, technological advancements have led to the creation of more anthropomorphic media agents, blurring the line between human and machine Finally, the nature of user interaction with media agents has also evolved (Gambino, Fox, & Ratan, 2020).

In light of these considerations, and given the nascent adoption of virtual influencers in Egypt, it remains an open question whether the CASA paradigm will exert a strong influence in this context. It is possible that user experience with technology or the use of technology and the affordances or potential actions offered by the virtual influencer itself might play a more significant role in shaping Egyptian consumer attitudes.

This contradiction between the two theories could be summarized in the difference between “humanness” and “eeriness” of virtual influencers. Despite growing convergence between humans and AI-powered systems, a critical distinction persists in how they are perceived. Sundar and Kim (2019) highlight this by noting that AI is largely viewed as machines, not sentient beings. This perception manifests in consumer resistance towards AI adoption in traditionally human-occupied roles, such as customer service although in some instances they trust them more(Sundar & Kim , 2019). This hesitation stems from the belief that machines lack inherent mentalities (Longoni & Cian, 2020 (thus less effective than humans) Li, Lei, Zhou, & Yuan, 2023).

Mind perception theory offers a valuable framework for understanding this divide. Core to this theory is the notion that the perceived capacity for intentionality, emotional experience, and cognitive processing differentiates human and machine perception) Liu & Lee, 2024; Gray & Wegner, 2012). In general, humans are attributed these "mind" characteristics to a greater degree than machines) Waytz, Heafner, &

Epley, 2014). However, as AI exhibits behaviors indicative of agency and consciousness, the perception of human-like qualities in these systems increases (Küster, Swiderska, & Gunkel, 2021) thus their threat to real humans increase(Jin & Viswanathan, 2024).

These notions raise the question to which is more effective, human-like or cartoonish VIs. Although Cartoonish VIs are clearly not human, thus they don't raise the issue of "eeriness" and "humanness", it's very hard for consumers to fully connect with them on an emotional level. On the other hand, human-like VIs are easier to create a unique personality to them, thus making them authentic, but if they are "almost" like a human they will trigger the "eeriness" effect.

In other words, when people perceived VIs as more human-like, they felt more empathy and engagement with them, which in turn led to greater compliance with the VIs' requests. Interestingly, eeriness, the opposite of humanness, also had an effect on empathy, but only for lonely people) Jin S. V., 2023).

There is also the question of Egyptian culture. In their review research Angmo et al. suggested the question of the effect of culture and religion o the acceptance of VIs, in addition to the question of whether citizens of developing countries would react differently those citizens of developed countries towards VIs) Angmo, Mahajan, & Oliveira, 2024). Egyptians are known to have strong sense of religion and culture; so will that affect their acceptance of Virtual Influencers.

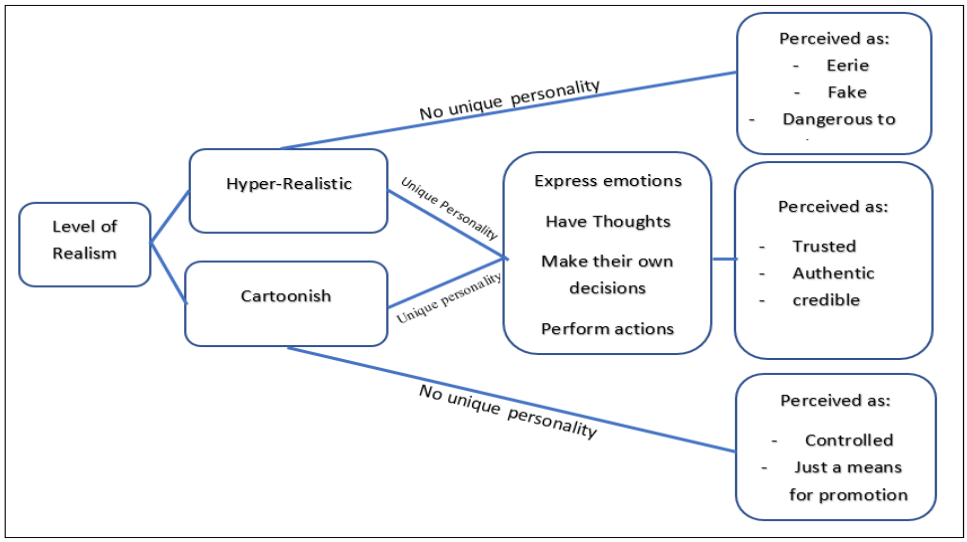


**Figure (1)**

Based on the previous arguments, this exploratory study has the following research questions:

**RQ1:**How does the level of anthropomorphism in virtual influencers (e.g., hyper-realistic vs. animated) influence Egyptian youth's perceptions of eeriness and emotional discomfort, as predicted by the Uncanny Valley Theory?

**RQ2:**To what extent does the perceived humanness of virtual influencers (e.g., hyper-realistic vs. animated) influence trust, authenticity, relatability, and engagement, and how does this relationship vary based on the transparency of their virtual nature, as suggested by the CASA Paradigm?

Also, this study proposes the following hypothesis:

**H1:** Egyptians who perceive virtual influencers (both hyper-realistic and animated) as having more human-like qualities (e.g., emotions, social cues) will exhibit higher trust and credibility towards them.

## Methodology

To address the research questions and test the hypotheses, this study utilized a survey methodology, employing online questionnaires as the

primary data collection tool. The target population consisted of Egyptian adults and young adults, segmented into two age groups: 18 to 25 years (young adults) and 25 to 35 years (adults). These age ranges were selected due to their significant purchasing power and their likely interest in emerging technologies and innovative concepts, such as virtual influencers.

Two active virtual influencers were chosen as focal points for this study: **Lil Miquela** and **Noonoouri**. These influencers were selected based on their distinct representations of virtual influencer typologies, as informed by the "Humanness Scale" developed by Arsenyan and Mirowska (2021). Lil Miquela exemplifies hyper-realistic virtual influencers, while Noonoouri represents cartoonish or stylized virtual influencers. Both are managed by independent creators or agencies.

**Lil Miquela**, also known as Miquela Sousa, is a computer-generated imagery (CGI) virtual influencer created by Brud, a Los Angeles-based company. Introduced to the public in 2016, Lil Miquela quickly gained prominence for her lifelike appearance and dynamic social media presence. Portrayed as a 19-year-old Brazilian-American model, singer, and activist, she is characterized by a distinctive style that merges streetwear with high fashion. Her social media content often addresses social issues, including racial justice and LGBTQ+ rights, further enhancing her relatability and appeal. With a substantial following on platforms such as Instagram and TikTok, Lil Miquela shares aspects of her daily life, music releases, and collaborations with globally recognized brands, including Prada, Calvin Klein, Samsung, and Supreme. Additionally, she has ventured into the music industry, releasing several singles and EPs that blend pop and R&B influences, thereby solidifying her multifaceted persona.

**Noonoouri**, on the other hand, is a virtual influencer created by German designer Joerg Zuber and launched in 2018. Known for her doll-like, hyper-stylized appearance, Noonoouri stands out among virtual influencers due to her unique aesthetic. She is portrayed as a fashion-forward and environmentally conscious virtual character, often advocating for sustainability and ethical fashion. Her content aligns with the values of modern consumers, emphasizing themes such

as veganism, animal rights, and environmental conservation. Noonoouri has established a strong presence on Instagram, where she showcases her collaborations with luxury fashion brands, including Dior, Versace, Valentino, and Fendi. These partnerships highlight the intersection of technology, fashion, and sustainability, positioning her as a distinctive voice in the virtual influencer landscape.

By selecting these two virtual influencers, the study aims to explore the varying perceptions of hyper-realistic and cartoonish virtual influencers among Egyptian youth and adults, providing insights into their influence on trust, authenticity, relatability, and engagement.

## Measurements

The following scales and their adapted versions were used to evaluate key dimensions of virtual influencers, including trust, credibility, authenticity, relatability, and engagement. Each scale is accompanied by sample items tailored to the context of virtual influencers, measured on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree).

### First: Trust

### Fiducial Trust Scale (Adapted):

This scale assesses trust in virtual influencers based on two dimensions: competence and benevolence. Sample items include:

- "I believe this virtual influencer has the knowledge and expertise to provide accurate information about the products they endorse."
- "I feel confident that this virtual influencer would not intentionally mislead me about a product."
- "I believe this virtual influencer is honest and truthful in their communication."

### Second: Perceived Authenticity

### Authenticity Perception Scale (Adapted):

This scale measures the extent to which a virtual influencer is perceived as genuine and sincere. Sample items include:

- "This virtual influencer seems to be acting naturally and not putting on a show."
- "I believe this virtual influencer's personality and opinions are genuine."

**Third: Relatability**

**Perceived Similarity Scale (Adapted):**

This scale assesses the degree to which individuals perceive similarities between themselves and a virtual influencer. Sample items include:

- "I feel like I can understand this virtual influencer's experiences and feelings."
- "This virtual influencer seems like someone I could be friends with in real life."

**Fourth: Engagement**

**Social Media Engagement Scale (Adapted):**

This scale measures the level of interaction and interest generated by a virtual influencer's content. Sample items include:

- "I find myself wanting to like, comment on, or share this virtual influencer's posts."
- "This virtual influencer's content is interesting and keeps me coming back for more."

**Results**

The survey was disseminated online, and participants were encouraged to share it with their contacts. The survey remained accessible for a period of two months, during which 344 responses were collected. After excluding respondents who reported not using social media, the final sample size comprised 337 valid responses. Data analysis was conducted using SPSS software, employing a combination of descriptive statistics (e.g., means, standard deviations, and frequency distributions) and inferential statistical techniques (e.g., Independent Samples t-test and One-Way ANOVA).

The sample demographic breakdown revealed a predominance of female respondents (n = 278) compared to male respondents (n = 59). In terms of age distribution, the majority of participants (n = 282) fell within the 18–25 age range, while a smaller proportion (n = 55) were aged 25–35. Regarding occupational status, the sample consisted primarily of students (n = 269), followed by employees (n = 55), business owners (n = 10), and housewives (n = 3).

A significant portion of respondents (57.8%) (n = 195) reported no prior familiarity with virtual influencers, while 42.2% (n = 142) indicated awareness of virtual influencers. Among those familiar with virtual influencers, 79.3% (n = 113) reported encountering them regularly on various social media platforms. Additionally, 85 respondents (25.2% of the total sample) stated that they followed at least one virtual influencer.

The findings suggest that Egyptian youth generally hold neutral to low perceptions of virtual influencers. Trustworthiness was evaluated as the least favorable attribute, with a mean score of 1.75 (SD = 1.32). Perceived appeal scored slightly higher, with a mean of 2.03 (SD = 1.16), while entertainment value received a mean score of 2.30 (SD = 1.21). The highest-rated attribute was innovativeness, with a mean score of 2.41 (SD = 1.16). These results indicate that while virtual influencers are recognized for their novelty, their perceived trustworthiness and appeal remain relatively low among the sampled population.

When asked about their perception of virtual influencers in general, respondents showed some skepticism concerning their ability to trust and engage with virtual influencers (mean = 2.17 and SD = 0.65). When asking specifically about the two virtual influencers under study, Maquila and Noonoori, this score even decrease more. The sum of means of all the likert-scale statements concerning Maquila was only 1.8 (SD = 0.81) and Noonoori was 1.73 (SD = 0.87). Although the respondents rated the hyper-realistic virtual influencer Maquila higher than the cartoonish virtual influencer Noonoori, the rating of both is still very low which indicates that the Egyptian youth aren’t really accepting of the idea of virtual influencers yet.

Looking at the four elements that were measured in this study (trust, relatability, perceived authenticity and engagement), the results show that Also, the “trust” aspect was rated the highest among the rest of the elements. Although

**Results of RQ1:**

The findings revealed a distinct preference among respondents for the hyper-realistic virtual influencer Maquila, with 62% (n = 209) expressing a favorable inclination toward her, compared to only 12.5% (n = 42) who preferred the cartoonish virtual influencer Noonoori. Furthermore, a significant proportion of respondents, 37.67%, indicated that it was either "extremely important" (n = 58) or "important" (n = 69) to follow virtual influencers who exhibit human-like characteristics. In contrast, 31.45% (n = 106) of respondents reported that the human-like appearance of virtual influencers was not a determining factor in their preference.

Qualitative insights highlighted that the majority of respondents (n = 171) favored Maquila due to her human-like appearance and ability to express emotions, which enhanced her relatability and perceived trustworthiness. However, a minority of respondents (n = 24) expressed discomfort with Maquila, describing her human-like qualities as "creepy." In contrast, perceptions of Noonoori were not influenced by concerns about creepiness. Respondents who preferred Noonoori cited their pre-existing affinity for anime or cartoon aesthetics as the primary reason for their preference. Conversely, those who did not favor Noonoori often associated cartoonish designs with content intended for children, which diminished their appeal.

These results underscore the nuanced interplay between virtual influencer design, perceived relatability, and user preferences, with hyper-realistic features generally eliciting stronger positive engagement, albeit accompanied by occasional discomfort among a subset of users.

## Results for RQ2:

**Table 1: Comparison of Trust, Authenticity, Relatability, and Engagement Scores for Maquila and Noonoori**

| Dimension | Maquila (Hyper-Realistic) | Noonoori (Cartoonish) | Significance (p-value) |
|---|---|---|---|
| Trust | 2.9169 (SD = 1.08860) | 2.8650 (SD = 1.12481) | p = 0.305 |
| Authenticity | 2.6743 (SD = 0.68345) | 2.6058 (SD = 0.72487) | p = 0.050 |
| Relatability | 2.8591 (SD = 1.21567) | 2.7641 (SD = 1.26890) | p = 0.062 |
| Engagement | 2.8264 (SD = 1.20773) | 2.7641 (SD = 1.29731) | p = 0.248 |

**Interpretation**: This table shows that while Maquila (hyper-realistic) scored slightly higher than Noonoori (cartoonish) across all dimensions, the differences were not statistically significant except for authenticity (p = 0.050). This suggests that the level of realism in VIs does not significantly moderate trust, relatability, or engagement.

A series of paired samples t-tests were conducted to compare mean scores across multiple dimensions—authenticity, trust, relatability, and engagement—between the hyper-realistic virtual influencer Maquila and the cartoonish virtual influencer Noonoori. Descriptive statistics revealed that Maquila consistently received slightly higher mean scores than Noonoori across all dimensions: authenticity (Maquila: M = 2.6743, SD = 0.68345; Noonoori: M = 2.6058, SD = 0.72487), trust (Maquila: M = 2.9169, SD = 1.08860; Noonoori: M = 2.8650, SD = 1.12481), relatability (Maquila: M = 2.8591, SD = 1.21567; Noonoori: M = 2.7641, SD = 1.26890), and engagement (Maquila: M = 2.8264, SD = 1.20773; Noonoori: M = 2.7641, SD = 1.29731). Significant positive correlations were observed between the scores for Maquila and Noonoori across all dimensions (authenticity: $r(337) = .591$, $p < .001$; trust: $r(337) = .650$, $p < .001$; relatability: $r(337) = .720$, $p < .001$; engagement: $r(337) = .691$, $p < .001$), indicating that respondents who rated one influencer highly on a given dimension also tended to rate the other influencer highly on the same dimension.

The paired samples t-tests revealed mixed results. For **authenticity**, a statistically significant difference was found between Maquila and Noonoori, t(336) = 1.971, p = .050, with a mean difference of 0.06850 (95% CI [0.00013, 0.13687]), suggesting that Maquila was perceived as slightly more authentic than Noonoori. However, for **trust**, **relatability**, and **engagement**, no statistically significant differences were observed: trust (t(336) = 1.028, p = .305, mean difference = 0.05193, 95% CI [-0.04742, 0.15128]), relatability (t(336) = 1.873, p = .062, mean difference = 0.09496, 95% CI [-0.00476, 0.19467]), and engagement (t(336) = 1.158, p = .248, mean difference = 0.06231, 95% CI [-0.04350, 0.16813]). These results suggest that while Maquila was perceived as marginally more authentic, the level of realism in virtual influencer portrayals did not significantly moderate trust, relatability, or engagement among respondents.

## Testing of H1

### 1- Maquila:

### Trust Scores

An independent samples t-test was conducted to compare the trust scores for the hyper-realistic virtual influencer Maquila between respondents who perceived human-like emotions (M = 2.9025, SD = 1.04862) and those who did not (M = 2.9407, SD = 1.11963). Results indicated no statistically significant difference in trust scores, t(334) = -0.321, p = .748, 95% CI [-0.27172, 0.19539]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence trust among respondents.

### Relatability Scores

An independent samples t-test was conducted to compare the relatability scores for the hyper-realistic virtual influencer Maquila between respondents who perceived human-like emotions (M = 2.8208, SD = 1.14776) and those who did not (M = 2.8983, SD = 1.27736). Results indicated no statistically significant difference in relatability scores, t(334) = -0.583, p = .560, 95% CI [-0.33929, 0.18419]. These findings suggest that perceiving human-like emotions

in the virtual influencer did not significantly influence relatability among respondents.

### Engagement Scores

An independent samples t-test was conducted to compare the engagement scores for Maquila between respondents who perceived human-like emotions (M = 2.8208, SD = 1.15189) and those who did not (M = 2.8418, SD = 1.25470). Results indicated no statistically significant difference in engagement scores, t(334) = -0.160, p = .873, 95% CI [-0.28051, 0.23841]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence engagement among respondents.

### Authenticity Scores

An independent samples t-test was conducted to compare the authenticity scores for Maquila between respondents who perceived human-like emotions (M = 2.6840, SD = 0.68173) and those who did not (M = 2.6723, SD = 0.68307). Results indicated no statistically significant difference in authenticity scores, t(334) = 0.156, p = .876, 95% CI [-0.13503, 0.15833]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence perceived authenticity among respondents.

### 2- Noonoori:

### Trust Scores

An independent samples t-test was conducted to compare the trust scores for Noonoori between respondents who perceived human-like emotions (M = 3.1250, SD = 0.64403) and those who did not (M = 2.8554, SD = 1.13815). Results indicated no statistically significant difference in trust scores, t(335) = 0.815, p = .416, 95% CI [-0.38111, 0.92034]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence trust among respondents.

## Authenticity Scores

An independent samples t-test was conducted to compare the authenticity scores for the cartoonish virtual influencer Noonoori between respondents who perceived human-like emotions (M = 2.7014, SD = 0.62306) and those who did not (M = 2.6023, SD = 0.72894). Results indicated no statistically significant difference in authenticity scores, t(335) = 0.464, p = .643, 95% CI [-0.32055, 0.51871]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence perceived authenticity among respondents.

## Relatability Scores

An independent samples t-test was conducted to compare the relatability scores for Noonoori between respondents who perceived human-like emotions (M = 2.5000, SD = 0.92932) and those who did not (M = 2.7738, SD = 1.27974). Results indicated no statistically significant difference in relatability scores, t(335) = -0.734, p = .464, 95% CI [-1.00807, 0.46038]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence relatability among respondents.

## Engagement Scores

An independent samples t-test was conducted to compare the engagement scores for Noonoori between respondents who perceived human-like emotions (M = 2.6667, SD = 0.93744) and those who did not (M = 2.7677, SD = 1.30964). Results indicated no statistically significant difference in engagement scores, t(335) = -0.265, p = .792, 95% CI [-0.85222, 0.65016]. These findings suggest that perceiving human-like emotions in the virtual influencer did not significantly influence engagement among respondents.

The hypothesis that Egyptians who perceive virtual influencers as having more human-like qualities (e.g., emotions) will exhibit higher trust and credibility was tested using independent samples t-tests. Results indicated no statistically significant differences in trust, authenticity, relatability, or engagement scores between respondents who perceived human-like emotions and those who did not, for both

the hyper-realistic influencer Maquila and the cartoonish influencer Noonoori. These findings suggest that perceiving human-like qualities does not significantly influence trust or other dimensions of virtual influencer perception, challenging the hypothesis. Instead, other factors may play a more critical role in shaping these perceptions among Egyptian respondents.

## Discussion

The findings of this study reveal several important insights into how Egyptian youth perceive virtual influencers (VIs), particularly in relation to their human-like qualities. While respondents showed a slight preference for hyper-realistic VIs like Maquila over cartoonish VIs like Noonoori, the perception of human-like emotions did not significantly influence trust, authenticity, relatability, or engagement. This challenges the hypothesis that human-like qualities (e.g., emotions, social cues) enhance trust and credibility toward VIs. Instead, the results suggest that other factors, such as cultural context, transparency, and the novelty of VIs, may play a more significant role in shaping perceptions.

## Hyper-Realistic vs. Cartoonish VIs

The preference for hyper-realistic VIs aligns with prior research suggesting that human-like avatars can foster a sense of relatability and emotional connection (Ju, Kim, &Im, 2024). However, the lack of significant differences in trust, authenticity, relatability, and engagement scores between respondents who perceived human-like emotions and those who did not indicates that human-like qualities may not be the primary driver of these perceptions. This finding contradicts the **Uncanny Valley Theory**, which posits that near-human resemblance can trigger discomfort (Kendall, 2024). Instead, the results suggest that Egyptian youth may not perceive hyper-realistic VIs as "creepy" or unsettling, possibly due to their familiarity with digital avatars in gaming and social media. It could also be attributed to the predisposition towards cartoons in general.

## Cultural Context

The study highlights the importance of cultural context in shaping perceptions of VIs. Egyptian youth, who are deeply rooted in cultural and religious values, may view VIs as less authentic or trustworthy compared to human influencers. This aligns with Angmo et al. (2024), who suggested that cultural and religious factors could influence the acceptance of VIs in developing countries. The low overall ratings for both Maquila and Noonoori suggest that Egyptian youth are still skeptical of VIs, possibly due to their artificial nature and lack of transparency. This aligns with the hypothesis that cultural context plays a significant role in shaping perceptions of VIs. The findings suggest that transparency about the virtual nature of influencers may be more important than human-like qualities in gaining trust and acceptance in this cultural context. Egyptian youth may value honesty and authenticity over the appearance of human-like traits.

## Transparency and Trust

The lack of significant differences in trust scores between respondents who perceived human-like emotions and those who did not underscores the importance of transparency in VI marketing. As Koles et al. (2024) noted, disclosing the virtual nature of influencers can mitigate feelings of distrust. The study's findings suggest that Egyptian youth may value transparency over human-like qualities, as they are more likely to trust influencers who are upfront about their artificial nature.

The study found no significant relationship between perceived human-like emotions and trust, authenticity, relatability, or engagement. This challenges the CASA Paradigm's assumption that human-like qualities in VIs would lead to stronger social connections and trust. The lack of significance may be due to the artificial nature of VIs. Egyptian youth may not fully attribute human-like qualities to VIs, especially if they are aware that these influencers are computer-generated. This aligns with the critique of the CASA Paradigm, which suggests that as technology becomes more integrated into daily life, users may develop

a greater awareness of the artificial nature of VIs, reducing their tendency to treat them as social actors.

The findings of El Kashif's study reveal that trustworthiness mediates the relationship between influencer type and consumer responses, while expertise does not significantly mediate purchase intentions. This aligns with the current paper's findings, which suggest that human-like qualities in virtual influencers do not significantly influence trust or authenticity among Egyptian youth. Both studies highlight the importance of **transparency** and **message congruence** in shaping consumer perceptions, particularly in contexts where skepticism around authenticity and credibility is high, such as in sustainability messaging or in culturally conservative markets like Egypt.

## Engagement and Relatability

The results also indicate that engagement and relatability are not significantly influenced by human-like qualities. This contradicts prior research suggesting that emotional expression and social cues enhance engagement (Yu et al., 2024). Instead, the findings suggest that Egyptian youth may engage with VIs based on other factors, such as content quality, brand alignment, or personal preferences.

## Conclusion

This study provides valuable insights into the perceptions of Egyptian youth toward virtual influencers, particularly in relation to human-like qualities. The findings challenge the hypothesis that human-like qualities enhance trust and credibility, suggesting that other factors, such as cultural context, transparency, and content quality, may play a more significant role in shaping perceptions. While respondents slightly preferred hyper-realistic VIs, the lack of significant differences in trust, authenticity, relatability, and engagement scores indicates that human-like qualities may not be the primary driver of these perceptions. The study contributes to the growing literature on virtual influencers by highlighting the importance of cultural context and transparency in shaping their reception in developing countries.

## Limitations

1. **Sample Demographics**: The study's sample was predominantly female (82.5%) and young (83.7% aged 18–25), which may limit the generalizability of the findings to other demographic groups, such as older adults or males.

2. **Cultural Specificity**: The study focused exclusively on Egyptian youth, which may limit the applicability of the findings to other cultural contexts. Future research should explore perceptions of VIs in other developing and developed countries.

3. **Limited Scope of VIs**: The study only examined two VIs (Maquila and Noonoori), which may not fully capture the diversity of virtual influencers in the market. Future research should include a wider range of VIs with varying levels of realism and anthropomorphism.

4. **Self-Reported Data**: The reliance on self-reported data may introduce biases, such as social desirability bias or response bias. Future studies could incorporate experimental designs or behavioral data to complement self-reported measures.

5. **Cross-Sectional Design**: The study used a cross-sectional design, which limits the ability to draw causal inferences. Longitudinal studies could provide deeper insights into how perceptions of VIs evolve over time.

## Recommendations for Future Research

1. **Expand Demographic Scope**: Future research should include a more diverse sample, including older adults, males, and individuals from different socioeconomic backgrounds, to better understand how demographic factors influence perceptions of VIs.

2. **Cross-Cultural Comparisons**: Comparative studies across different cultural contexts could provide insights into how cultural and religious factors shape perceptions of VIs. For example, comparing Egyptian youth with youth from Western or Asian countries could reveal cultural differences in VI acceptance.

3. **Explore Additional VIs**: Future studies should examine a broader range of VIs, including non-human avatars and brand-operated VIs, to

understand how different types of VIs influence trust, authenticity, relatability, and engagement.

4. **Incorporate Behavioral Data**: Future research could incorporate behavioral data, such as click-through rates or purchase behavior, to complement self-reported measures and provide a more comprehensive understanding of VI effectiveness.

5. **Longitudinal Studies**: Longitudinal studies could explore how perceptions of VIs evolve over time, particularly as VIs become more prevalent in marketing campaigns. This could provide insights into the long-term impact of VIs on consumer behavior.

6. **Examine Ethical Concerns**: Future research should explore the ethical implications of using VIs, particularly in relation to transparency, authenticity, and consumer trust. This could include examining how disclosure of a VI's artificial nature influences perceptions and engagement.

7. **Gaming as a Moderating Factor**: Given the popularity of gaming among Egyptian youth, future research could explore how gaming experiences influence preferences for hyper-realistic vs. cartoonish VIs. Gamers may be more accepting of cartoonish VIs due to their familiarity with animated characters in gaming contexts.

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