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Fashion Virtual Influencers: Antecedents Influencing Females' Behavioral Intentions in Jordan

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Abstract

Objectives: Social media influencers and celebrities have traditionally been utilized by marketers. However, with the advancements in artificial intelligence, virtual influencers are gaining popularity on social media platforms. As a result, companies are compelled to incorporate this emerging trend into their social media campaigns. However, there is limited research available regarding the effectiveness criteria of virtual influencers to guide marketers in their selection decisions. Therefore, this study aims to investigate the attributes of virtual influencers that impact consumer behavioral intentions, specifically within the fashion domain.

Methods:. To measure the antecedents to influencing behavioral intentions, 224 online surveys were distributed to female Instagram users selected through convenience sampling method. The empirical design of the study involoved several Instagram posts created as if by a virtual influencer promoting a fictional fashion brand. These posts measured the constructs related to the research questions, drawing from validated digital human and influencer marketing literature. The collected data was analyzed using the Partial Least Squares method.

Results: The study findings revealed that content informativeness, bonding, expertise, human like attributes, and consumer innovativeness all had varying degrees of influence on behavioral intentions, with content informativeness being the most influential factor.

Conclusions: The study contributes to the limited literature on virtual influencers and provides novel practical implications to marketers. It also suggests the need for further in-depth studies to identify effective attributes of virtual influencers.

Keywords: Virtual influencer, fashion influencer marketing, computer generated influencer, CGI influencer, AI influencer.

المؤثرين الافتراضيين للباس العصري: العوامل التي تؤثر في النو ايا السلوكية للإناث في الأردن

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ملخّص

الأهداف: يعدّ استخدام المؤثرين والمشاهير في منصات وسائل التواصل الاجتماعي من الأدوات التسويقية الفعالة عند الترويج للعلامات التجارية ولكنه لا يخلو من التحديات والآثار السلبية في المنتج في بعض الاحيان، والآن مع التقدم التكنولوجي في تقنيات الذكاء الاصطناعي، يمكن للمسوقين تجاوز هذه التحديات عن طريق استخدام المؤثرين الافتراضين في حملاتها التسويقية في وسائل التواصل الاجتماعي، ورغم ذلك، لا يوجد هناك دراسات سابقة محلية تتعلق بمعايير والسمات التي تجعل المؤثر الافتراضي virtual influencerناجحًا، لمساعدة المسوقين على كيفية اختيار المؤثر الافتراضي الخاص بالعلامة التجارية ولذلك تهدف هذه الدراسة إلى اكتشاف سمات هؤلاء المؤثرين الافتراضيين التي تجعلهم مؤثرين في المستهلك وأثرها في نواياهم الشرائي..

المنهجية: لبناء نموذج هدفه استكشاف ما هي تلك السمات الداخلية التي تؤثر في نوايا المستهلك السلوكية، جرى توزيع 224 استبانة باستخدام طريقة أخذ العينات الملائمة وجرى استخدام نمذجة المعادلة الهيكلية (PLS)لاختبار معايير فعالية المؤثر الافتراضي في الإناث في الأردن.

النتائج: كشفت النتائج أن المحتوى الإعلامي القيم، وخلق ترابط عاطفي مع المستهلك، والخبرة المدركة للمؤثر، السمات الشبيهة بالإنسان، ودرجة اهتمام المستهلك بالموضة كانت جميعها مؤثرة بدرجات متفاوتة، ولكن قيمة المعلومات بالمحتوى الإعلامي هي الأكثر تأثيرًا على النوايا السلوكية.

الخلاصة: تساهم هذه الدراسة على فهم السمات التي تجعل المؤثرين الافتراضيين فعالين، وتقدم الدراسة إرشادات للعلامات التجارية في كيفية تحديد واستخدام المؤثرين الافتراضيين لعمل حملات تسويقية ناجحة وفعالة.

الكلمات الدالة: استخدام تقنيات الذكاء الاصطناعي، المؤثر الافتراضي، التحول الرقمي، تسويق اللباس العصري، المؤثر الافتراضي في الباس العصري.

1. Introduction

Recently, Influencer marketing market size is witnessing an exponential growth, and is expected to exceed US$ 373 millions by 2027 worldwide (Statista, 2021).

According to previous literature, Influencer and celebrity endorsements have several benefits for marketers, such as reaching online audiences (Belanche et al., 2020), influencing consumers positive attitude (Djafarova and Rushworth, 2017), enhancing perceived brand image (Piehler et al., 2021), and increasing willingness to purchase (Chetioui et al., 2020). Nevertheless, previous literature indicated challenges associated with human influencer's marketing, such as high expenses of influencer, and endorser's misbehavior (Thomas and Fowler, 2021). Furthermore, Influencers can deceive companies by purchasing followers and likes (Harrigan et al., 2021).

An emerging trend that would overcome these challenges is using virtual influencers (Thomas and Fowler, 2021). According to Silva and Bonetti (2021, p.1), virtual influencer is defined as "a life-like being, powered by artificial intelligence (AI), with the capability of conversing, communicating, and creating an emotional connection, like any other human being".

Although virtual influencer endorsements are deployed by several luxury fashion brands like Prada, Chanel, and Louis Vuitton (Moustakas et al., 2020). Yet, there is limited research concerning virtual influencers antecedents to influencing consumers behavioral intentions in fashion (Appel et al., 2020). This research intends to bridge this knowledge gap in literature, drawing on influencers marketing and digital human's literature by answering the following main questions:

- What are the virtual influencer antecedents to influence fashion consumers behavioral intentions?
- Which characteristics of virtual influencer impact fashion consumers behavioral intentions the most?
- Does consumer's innovativeness level impact virtual influencer effectiveness?

2. Literature Review

According to previous literature reviewed on digital humans and influencer marketing, four themes were identified for artificial entity effectiveness and influence:

1-Virtual influencer characteristics 2-Content characteristics 3-Creating rapport with audience 4-Innovativeness level of consumer.

2.1 Fashion Virtual Influencer Characteristics

Often fashion shoppers specially generation Y an Z are highly involved in fashion trends and acquire information from social media. Such trends are heavily influenced by fashion influencers views (Park and Kim, 2016; Kádeková and Holienčinová, 2018), since fashion followers perceive influencer's opinions as more trustworthy than fashion brands marketing communications (De Veirman et al., 2017; Jin et al., 2021). A study by Klear (2020) found that fashion and accessories industry had the biggest shares of using fashion influencers on Instagram in year 2020.

Nowadays, virtual influencers are rising and expected to be the future of influencers marketing (ONG, 2020). Luxury fashion marketers like Calvin Kline, and Prada had been using fashion virtual influencers like Shudu Gram and Lil Miquela on Instagram in their marketing campaigns (Moustakas et. al, 2020).

A Fashion influencer is defined as "personalities with large number of followers on social media who generate fashion content and have the power to persuade followers' opinion and purchase behavior" (Chetioui et al., 2020, p.1).

The assessment criteria mainly used often by marketers to evaluate influencers are number of followers, trustworthiness, and expertise (Halder et al., 2021;De Veirman et al., 2017; Chetioui et al., 2020;Jin et al., Muqaddam, 2021).

However, since the objective of this study was to suggest a model for identifying virtual influencers criteria that make them influential, it was indispensable that such model is based on reviewed literature on humans influencers and virtual humans.

One key aspect emphasized in virtual humans' literature is digital human characteristics required to be accepted by humans, as not all individuals prefer interactions with artificial entities (Gulz, 2004). However, by integrating human traits,

virtual influencer could be approved by humans (Lin et al., 2020;Grewal et al., 2020; Moon, 2000). This can be explained by the inherent human nature of liking people who are similar, and "this fact seems to hold true whether the similarity is in areas of opinions, personality traits, background or lifestyle" (Cialdini, 2007, p. 173).

The approval of robots or digital humans require consumers to perceive them physically as nearly humans (Lin et al., 2020; Kim et al., 2019), otherwise this could have adverse effect according to uncanny valley theory, which argues that humans feel uncomfortable when artificial entity looks too real to humans (Kim et al., 2019). Therefore, robots should look like 'synesthetic human'.

While Van Doorn et al. (2017) indicated that robot or artificial entity similarity to human face features is crucial in human-computer communications for relationships experience enhancement, a study by Stroessner and Benitez (2019), also indicated that artificial entity that looks feminine and similar to humans facilitated forming positive attitudes towards them.

Based on the discussion, the first hypothesis is established as follows:

H1: Human like features of virtual humans have a significant positive effect in influencing fashion consumers and their purchasing intentions.

Another key attribute highlighted in influencer, and digital humans' literature is the influencer's perceived expertise.

Previous digital human's literature stressed on the perceived expertise of artificial entity (Gonzales and Vila, 2021; Holzwarth et al., 2006; Schroeder et al., 2018).

Holzwarth et al. (2006) study on digital humans, found expertise was more prominent than attractiveness at high involvement level. This is in line with Gonzales and Vila (2021) study findings on website avatars which also indicated that expertise is more important than attractiveness when targeting female consumers in hospitality industry.

This is further indicated in marketing literature on the impact of expertise on persuasiveness and behavioral intentions (Schouten et al. 2020). In contrast, Ki et al. (2020) refuted human influencer expertise impact on fashion buying intentions.

However, virtual humans' trustworthiness was negatively perceived by humans (Sands et al., 2022; Riedl et al., 2014).

Based on the discussion, the second hypothesis is established as follows:

H2: Virtual influencers perceived expertise has significant effect in influencing fashion consumers and their buying intentions.

2.2 Influencer Bonding

Another key attribute indicated in digital humans' literature is the importance of displaying behaviors similar to human's social interactions to build rapport, and social bonds with humans (Shin and Lee, 2020; Van Doorn et al., 2017). This is because satisfying individual social needs facilitates artificial entity acceptance by humans, and enhances influence (Stock and Merkle, 2018). Moustakas et al., (2020) findings suggest that virtual influencers who share content that imitate humans, such as sharing their ambitions, challenges, and personal struggles facilitate creating bonds with audience.

This was further highlighted in influencer marketing literature, which indicated that influencers who share content that build rapport and connectedness, such as sharing personal content about their activities and interests, enhance influence (Audrezet et al., 2020; Chung and Cho, 2017; Ki et al., 2020; Ladhari et al., 2020).

Such findings can be explained with Human brand theory, according to Thomson (2006), people can get attached and form relationships with celebrities, or influencers as if they knew them in real life, if they satisfy audience relatedness, competence, and autonomy needs.

In conclusion, author believes that virtual influencer's content that builds rapport and connectedness with followers is a crucial antecedent to influence.

Based on the discussion, the third hypothesis is established as follows:

H3: Virtual influencers bonding has a significant positive effect in influencing fashion consumers and their buying intentions.

2.3 Virtual Influencer's Content

Previous marketing literature indicated that informative content is essential for influencing followers. According to Ki et al. (2020) study findings, informative content was found to be one of the underlying factors that facilitate forming attachment with followers by satisfying competence needs, and hence influence follower's behavior.

Ki and Kim (2019) investigated the crucial role of influencer's content as source of information in buying decisions. McQuarrie and Phillips (2014) study findings indicated that followers are affected by such informative content shared and deemed influential due to perceiving influencer as expert in field. This was further indicated and aligns with digital human literature findings on informative content significance (e.g. Schroeder et al., 2018).

However, Al-Emadi and Ben Yahia (2020) findings on opinion leadership suggest that not only the content has to be informative but has appeal and matches influencer profile.

Hence, these findings indicates that consumers view fashion opinion leaders as a source of information for fashion trends (Flynn et al., 1996).

Based on the discussion, the fourth hypothesis is established as follows:

H4: Virtual influencer Content Informativeness has a significant positive effect in influencing customers and their buying intentions.

2.4 Consumer's Innovativeness

Consumer innovativeness personality trait has been considered an important variable that influence consumer behavioral intentions (Goldsmith et al., 1999; Hirshman, 1980; Midgley and Dowling, 1978).

According to Midgley and Dowling (1978), innovativeness is defined as 'the tendency to purchase new products more often and more quickly than other people'.

Furthermore, Goldsmith et al. (1999) study findings indicated that demographic characteristics was not a significant factor in influencing new product purchases, however innovativeness was a valid predictor of consumer new product adoption.

According to literature, there are two types of innovativeness; general innovativeness and domain-specific innovativeness; however, the latter was found to be more effective predictor of new product adoption by consumers (Citrin et al., 2000; Goldsmith and Hofacker, 1991; Hirshman, 1980). A valid and reliable domain-specific innovativeness scale, often adopted when measuring consumers fashion Innovativeness, is the one developed by Goldsmith and Hofacker (1991).

In conclusion, the author believes that fashion female consumers whose personality is high on innovativeness, would be influenced also higher by virtual influencers due to their psychological disposition of accepting novel and new things. Therefore, the hypothesis proposed is:

H5: The higher the innovativeness level of fashion consumers, the stronger virtual influencer effect on fashion consumers behavioral intentions.

3. Methodology

3.1 Measurements

The questionnaire used in this study intended to identify the antecedents of influence; the virtual human characteristics, and consumer's fashion innovativeness constructs, and their effect on influencing consumers behaviors in the fashion industry. The variables selected in the conceptual model were based on the most frequently cited concepts found in literature for understanding the psychology of influence, and effectiveness. (See Figure 1).

Accordingly, a fictional fashion brand was elected. The purpose for selecting a fictional brand is to guarantee that respondents do not have any prior brand associations. Such procedure is proper when choosing a particular test case for study for a new emerging phenomenon in order to answer research questions (Yin, 1994).

Using a convenience sampling method, the data were gathered by online surveying Instagram female users in Jordan. The argument for not using random sampling to enhance generalizability is based on Calder et al. (1982, p.240) study findings that "it is concluded that the very nature of progress in theoretical research argues against attempting to maximize external validity in the context of any single study". The research sample consisted of females based on previous literature which demonstrated that females are often highly involved in fashion compared to males,hence an important target to study (O'Cass, 2004). Additionally "any gender confounds are avoided since females are more susceptible to social influence than males" (De Veirman et al., 2017,p.809).

Thereafter, respondents were exposed to different manipulated Instagram fashion posts related to constructs measured using a popular virtual influencer called (Lil Miquela). The choice of this particular virtual influencer (lil miquela; www.instagram.com/lilmiquela) was not random, but due to influencer behaving and communicating similar to humans (Chowdhary, 2019), familiarly of this influencer to the audience with over 3 million followers, the human-like appearance,and it's popularity as fashion icon collaborating with luxury brands as influencer (AMA.org, 2019).

(See Figure 2).

The measures in the questionnaire used five-point Likert-type scales, which ranged from "strongly disagree" (1) to "strongly agree" (5) as follows:

The independent variables were: Human Like Perception (Two items), Expertise (3 Items), Bonding (Two Items), Content informativeness (Two Items), Innovativeness Level (3 Items).

While dependent variables were: Influence (4 Items), and Buying Intentions (1 Item).

Furthermore, a control variable was used to screen out respondents who are familiar with the virtual influencer stated in the study, as these respondents might have previous attitudes that could affect study outcomes.

Table (1): Research Constructs

Construct	Items	References
Human Like VI	3 Items	Van Doorn et al., (2017)
Expertise	3 Items	Liljander et al., (2015)
VI Bonding	2 Items	Adapted from Park et al., (2010)
Content Usefulness	2 Items	Casaló et al., (2020)
Influence	5 Items	Adapted from Flynn et al., (1996)
Intention to buy	1 Items	Jamieson and Bass, (1989)
Innovativeness	3 Items	Adapted from Goldsmith, and Hofacker, (1991)

*The scale was modified to fit this study by changing the word 'Virtual human/avatar/Agent' to 'virtual influencer'

Prior to starting data collection, a pilot study was conducted, and female respondents (n=30) were selected conveniently from University of Jordan to evaluate internal reliability of items in each construct and ensure questions understanding. Cronbach's alphas for variables demonstrated high reliability (>0.70) values, and surpassed recommended threshold, which suggest that the measures for the scales were internally consistent (Hair et al., 2013).

3.2 Analysis and Findings

In details, out of 400 questionnaires distributed, only 224 were considered for further analysis, as about 28.6% of the respondents were familiar with the virtual influencer in study, and had to be eliminated to avoid any confounds that might arise from such identification. Also, some cases were inappropriate for analysis due to being unreliable, and accordingly were removed from further analysis.

Data was analyzed using SPSS (Version 23.0) and Smart-PLS 3.3 respectively. Descriptive statistics were calculated to summarize and give general snapshot about data, while Structural Equation Modelling (S.E.M) was used to test the research hypotheses.

The Researcher conducted Partial Least Square (PLS) for several reasons; first, the sample size is relatively small (n=224) and considered appropriate for PLS statistical technique requirements, since it complies with 10 times rule of the largest number of structural paths directed at a particular construct in the structural model (Hair et al., *2013)*; second, due to technique usefulness when researching a new phenomenon with complex type of relationships. Furthermore, this statistical method was used in several studies in celebrity and influencer literature (e.g. Casalo et al., 2020; Kim et al., 2019).

Descriptive statistics analysis demonstrated that 52.3% of the respondents age were between 20-29, followed by 19.8% of respondents age between 30-39.

As for the educational level of the respondents, the majority had a bachelor's degree (93 %), followed by 7% who had a master's qualification or higher degree. Finally, 85% of respondents were daily user of Instagram, and resides in Jordan.

Furthermore, VI Human-Like, VI Expertise, VI Bonding, VI Content, Innovativeness, and VI influence mean scores and standard deviation were employed to evaluate the general consumers views and their tendencies regarding the subject matter.

Table 2 shows that the means range from 2.19 to 3.26, with the highest mean being VI content and innovativeness items (Somewhat respondents agree on given items) and the lowest were for VI expertise (respondents disagree regarding VI level of expertise).

Although these descriptive analysis results demonstrates that majority of respondents strong tendency toward the neutral response, however there are wide difference in opinions regarding the subject matter, apparent with the high standard deviation scores (S.D) for items.

Table (2) Research Model Variables Descriptives

Variable	Mean	S.D
VI Human-like	3.01	0.93
VI Expertise	2.19	0.72
VI Bonding	2.82	0.93
VI Content	3.26	0.94
Innovativeness	3.11	0.79
VI influence	2.81	0.96
Buy	2.79	1.04

Prior to testing research hypothesis, confirmatory factor analysis (CFA) was conducted in order to assess model fitness utilizing Standardized Root Mean Square Residual (SRMR), and normed-fit index (NFI). Based on analysis three items had to be removed from further analysis due to weak loadings (<0.70). The results demonstrated that CFA indices were within acceptable threshold (SRMR=0.05), (NFI=0.881). Thus, measurement model was sufficiently fit to observed data.

Next, factors loading, composite reliabilities, and Average Variance Extracted (AVE) were evaluated for convergent validity and reliability prior to testing model hypothesis significance. All factor loadings were (>0.70) which exceeded recommended value (Hair et al., 2013), hence indicators' reliability was confirmed. Also composite reliability scores were (>0.70) which exceeded recommended value as per (Chin et al., 2008).

Furthermore, convergent validity was measured through the average variance extracted (AVE). All latent variables showed (AVE) values higher than 0.50 (Hair et al., 2013).

Finally, in Table (4) it is demonstrated that all variables achieved discriminant validity according to Fornell-Larcker criterion,because the square root of AVEs was larger than corresponding correlation coefficients among constructs (Fornell and Larcker, 1981). Thus, indicating the distinctiveness of constructs, and proving a robust valid model to proceed further in hypothesis testing. (See Table 3 and 4).

Table (3) Validity, Reliability and Factors loading

Construct	Item	Factor Loading	Composite Reliability	Average Variance Extracted (AVE)
Human Like	Human_like2 Human_like3	0.887 0.89	0.883	0.79
Expertise	Expertise1 Expertise2	0.905 0.901	0.899	0.816
VI Bonding	Social1 Social2	0.964 0.954	0.958	0.92
Content Usefulness	Content1 Content2	0.887 0.912	0.889	0.8
Influence	Influence1 Influence2 Influence3 Influence4 Influence5	0.854 0.9 0.87 0.884 0.9	0.946	0.778
Buying Intentions	Purchase Intention	1	1	1
Innovativeness Level	Innovativeness1 Innovativeness2	0.854 0.932	0.888	0.799

Table (4) Discriminant validity analysis

Construct	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7
Human Like	0.889						
Innovativeness	0.209	0.894					
Expertise	0.075	0.029	0.903				
Bonding	0.403	0.158	0.448	0.959			
Content	0.372	0.415	0.414	0.467	0.895		
Influence	0.396	0.365	0.57	0.64	0.755	0.882	
Buying Intent	0.115	0.253	0.279	0.432	0.438	0.49	1

Thereafter, to examine research conceptual model and answer research questions concerning virtual influencer antecedents to influencing fashion consumers, Partial Least Square (PLS) was conducted to estimate the model's path coefficients. Next author performed bootstrapping procedure to test hypothesized direct and indirect effects, specifying 5,000 sub- samples and a 95% significance level (Hair et al., (2013) using SmartPLS (v. 3.2.9). Moreover, R squared, beta, corresponding t-values, and effect size (f squared) were calculated (Cohen's, 1988).

The analysis results indicated that content informativeness had the largest effect on respondents and influenced fashion consumers the most (β=0.449; $p < 0.01$), with large sized effect (f2=0.423), affecting indirectly buying intentions (β=0.22; $p \leq 0.01$).

As for expertise, it influenced respondents (β=0.255; $p \leq 0.01$), with medium effect (f2=0.167), and influenced indirectly buying intentions (β=0.125; $p \leq 0.01$).

Additionally, bonding also influenced respondents (β=0.266; $p < 0.01$), with medium effect (f2=0.163),and influenced indirectly buying intentions (β=0.13; $p < 0.01$).

Furthermore, human like attributes were found to be influential on respondents (β=0.079; $p < 0.05$),with small effect

(f2=0.019) and affected indirectly buying intentions (β=0.044; p ≤ 0.05).

Finally, fashion innovativeness influenced respondent's positivity (β=0.113; p ≤ 0.01) with small effect (f2=0.038),and affected indirectly buying intentions (β=0.055; p ≤ 0.01).

For predictive power observed for the research model, r-squared reveals that 72.8% of the data fit the regression model observations, hence study predictor variables explained well changes in the (Influence) variable, while the remaining 27.2% is explained by other variables outside the research model.

As the research Model explains about 72.8% of variables that accounted for influencing behavioral intentions, model was considered robust and strong fit (R2= 0.728) (Chin et al.,2008).

Therefore, H1, H2, H3,H4,H5 are supported. (See Table 5).

Table (5) Research Model Hypotheses

Predictor	Research Hypotheses	SE	T value	β	p value	f^2 (Effect size)	Decision
VI Human-like	Human Like VI--> Influence	0.04	2.17	0.079	0.03*	0.019 Indirect Effect	Support H1
	Human Like VI --> Buying Intentions	0.02	2.102	0.039	0.036*		
VI Expertise	VI Expertise --> Influence	0.05	4.8	0.255	0.0**	0.167 Indirect Effect	Support H2
	VI Expertise -> Buying Intentions	0.03	4.342	0.125	0.0**		
VI Bonding	VI Bonding --> Influence	0.05	5.815	0.266	0.0**	0.163 Indirect Effect	Support H3
	VI Bonding--> Buying Intentions	0.03	4.651	0.13	0.0**		
VI Content	Content Usefulness --> Influence	0.05	8.346	0.449	0.0**	0.423 Indirect Effect	Support H4
	Content Usefulness --> Buying Intentions	0.04	5.872	0.22	0.0**		
Innovativeness	Innovativeness Level --> Influence	0.04	3.069	0.113	0.002**	0.038 Indirect Effect	Support H5
	Innovativeness --> Buying Intentions	0.02	2.849	0.055	0.004**		

* p <.05 ** p <.01

4. Discussion

Interest in artificial intelligence applications in marketing has been growing at an increasing rate. This study is the first to explicate the underlying mechanism and constructs that explain virtual influencers impact on consumers in fashion context.

This study has revealed important contributions to literature. One major finding concerns the role of information usefulness in influencing fashion consumers in Jordan. The findings suggest that information usefulness effect is profound as indicated in statistical analysis for the effect large size (f squared=0.423), which implies that virtual influencers are considered as useful information source for fashion trends before deciding to purchase. This is aligned with (Ki et al., 2020;Ki and Kim 2019; Al-Emadi and Ben Yahia, 2020;McQuarrie and Phillips, 2014) findings on the role of the content usefulness in affecting behavioral intentions.

Hence, fashion influencers are considered as source of information for fashion trends (Flynn et al., 1996).

A second major finding of this study relates to virtual influencer perceived expertise role in influencing female consumers. The findings support the conclusions of the previous studies on impact of expertise on influence (e.g. Gonzales and Vila, 2021; Holzwarth et al., 2006). According to Holzwarth et al. (2006); and Gonzales and Vila (2021) findings,

digital avatars expertise was more crucial than attractiveness in influencing behavior.

Similarly, virtual influencer human like attributes was found to have impact on buying intentions and influenced female consumers positively: the more the virtual influencer looks and acts like humans, the more it influences female fashion consumers behavioral intentions.

These results are mainly one of the contributions of the research due to lack of previous literature examining this variable, hence, more empirical research required to examine this variable further.

Surprisingly, virtual influencer's bonding was found to effectively impact level of influence and buying intentions. These findings are aligned with the study of Ki et al. (2020) who analyzed the impact of social media influencer bonding on influence and found a positive effect.

It may be inferred from these findings, that the perceived similarity of human features, and the humanized interactions of the virtual influencer through the manipulated posts, facilitate building rapport with the virtual influencer (Cialdini, 2007; Moon, 2000).

Finally, this study also investigated the role of consumer's fashion innovativeness level on virtual influencer impact. Findings suggests that the more female consumers have an innovative personality trait, the more likely they were influenced by virtual influencers. Such results are mainly one of the contributions of the research as there is a lack of past literature examining this variable effect in relation to virtual influencer.

In conclusion, no matter the influencer was human or virtual, fashion virtual influencers had the same impact as human influencers in affecting behavioral intentions.

5. Theoretical and managerial implications

Despite the wide research available on influencer marketing, there is limited research available on virtual influencers, that explains antecedents to influencing fashion consumers. The current research was able to bridge the knowledge gap on virtual influencers by identifying required characteristics and content strategy to influence fashion consumers and the buying intentions of fashion consumers in Jordan.

Additionally, the main findings of this research have novel theoretical and managerial implications for researchers and marketers.

As argued in the introduction, human influencer's endorsements come at a price and challenges for companies, and this may impact their brand image in case of influencer issues arise. Consequently, there was a need to explore the possibility of using computer-generated virtual influencers to help marketers understand the main factors that can positively influence fashion consumer behaviors. However, no research has previously examined computer-generated virtual influencers usage to promote fashion products and impact on buying intentions of females in Jordan.

Based on current research findings, five major areas are identified for virtual influencer's effectiveness: a human like persona, and to be perceived as expert in content shared, as well as sharing useful information, and crafting content that build rapport with audience. Similarly identifying and targeting innovative consumer will ensure effective impact of virtual influencer.

In conclusion, as virtual influencers proved to be effective in promoting fashion brands, they can be used as alternative to human influencers, particularly when new brands require a specific influencer persona that matches the brand precisely, or when marketers demand more control over content posted by the influencer.

The influence antecedents identified in this study can be used as a blueprint for companies that wish to choose a ready-made virtual influencer, or when creating one from scratch.

6. Future research and study limitations

Virtual influencer's trend is expected to grow on social media in upcoming years.

Consequently, it will be crucial to study in-depth the virtual influencers phenomena with focus on their effectiveness across different industries, and cultures. Furthermore, studying the virtual influencer's image meaning transfer to new

brands, and how consumer characteristics impact virtual influencers acceptance is required.

The current research has the following limitations. First, the research was conducted on female fashion consumers, hence findings can only be generalized on female fashion consumers. A more extensive study can add valuable contributions to the literature.

Second, the study was based on studying one virtual influencer. Consequently, collecting data for more virtual influencers would get more generalizable results.

Third, culture was not considered in study, as respondents may have religious beliefs regarding dress, or being conservative, that prevent them from following fashion trends conveyed in the manipulated posts.

Finally, since this research adopts a quantitative approach, a study based on qualitative approach could add a valuable contribution and in depth understanding of consumer psychology when interacting with virtual influencers.

7. Declaration of Competing Interest

None.

8. Research Data Availability

Yes.

10.Appendix

Table (6) Measurement Constructs details

Construct	Items	References
Human Like	-I can imagine the Virtual influencer as a living creature -Sometimes it seemed as if the Virtual influencer had feelings -The Virtual influencer makes me feel as if I was in the company of another social entity'	Van Doorn et al., (2017)
VI Bonding	-Felt I am someone who would enjoy interacting with a like-minded virtual influencer -I feel personally connected to this virtual influencer	Adapted from Park et al, (2010)
Content Usefulnes	-This Instagram account offers interesting pictures that suggest new ideas about fashion. -I could use this Instagram account as a source of information.	Casaló et al., (2020)
Expertise	Not Qualified 0 0 0 0 0 Qualified Not Expert 0 0 0 0 0 Expert Not Knowledgeable 0 0 0 0 0 Knowledgeable	Liljander et al., (2015)
Influence	-I would feel comfortable dressing as shown in the pictures published on this Instagram account. -I would not hesitate to take into account the suggestions about clothing I can find in the pictures published on this account -I would rely on the recommendations about clothing made by this Instagram account I would pick products based on what she posts. -This influencer could influence my opinions about lifestyle.	Adapted from Flynn et al., (1996)
Intention to buy	-Definitely will not buy what clothes she is wearing from this brand -Probably will not buy clothes she is wearing from this brand -Might Buy clothes she is wearing from this brand -Probably will buy clothes she is wearing from this brand -Definitely will buy clothes she is wearing from this brand	Jamieson and Bass, 1989
Innovativeness	-I know more about new fashion before other people do -If I heard that a new outfit was available, I would be interested enough to buy it -I consider buying new emerging fashion trends	Adapted from Goldsmith, and Hofacker, (1991)

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