
Factors of virtual influencer marketing influencing Generation Y consumers' purchase intention in Malaysia

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Abstract: The advent of computer-generated virtual influencers disrupts the convention of traditional influencer marketing that relies on real human influencers as brand ambassadors. This study sheds light on the key factors of virtual influencer marketing that affect the purchase intention of Generation Y consumers in Malaysia by using relevant ideas from TEARS model and theory of planned behaviour. Using data analysis based on 450 respondents, it is confirmed that factors such as parasocial interaction and attractiveness have highly significant effects, except for perceived realism and trustworthiness. Interestingly, attitude towards virtual influencer strongly mediates the relationship between the significant factors (parasocial interaction and attractiveness) and purchase intention. Lastly, gender and persuasion knowledge only have significant moderating effects in the relationship between parasocial interaction and purchase intention, but they are insignificant towards other factors.

Keywords: virtual influencer marketing; parasocial interaction; attractiveness; trustworthiness; purchase intention; Malaysia.

Reference to this paper should be made as follows: Yap, Y.R. and Ismail, N. (2022) 'Factors of virtual influencer marketing influencing Generation Y consumers' purchase intention in Malaysia', *Int. J. Internet Marketing and Advertising*, Vol. 17, Nos. 3/4, pp.437–458.

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This paper is a revised and expanded version of a paper entitled 'Factors of virtual influencer marketing influencing Generation Y consumers' purchase intention in Malaysia' presented at BLM2-ICAM4 International Joint e-Conference held by Centre for Industrial Revolution and Innovation (CIRI), Taylor's Faculty of Business and Law, Taylor's University, Malaysia and Department of Marketing Management, University of Kelaniya, Sri Lanka, 11 September 2021.

1 Introduction

The technology advancement has initiated a new era of virtual influencers. Virtual influencers are computer-generated characters that play similar roles as celebrities, public figures, and other real human influencers on social media platforms. One of the popular examples would be Miquela Sousa, also known as Lil Miquela, who is the first virtual influencer with over two million followers on Instagram (Robinson, 2020). Lil Miquela is the first of its kind to be named by Time Magazine as one of the '25 Most Influential People on the Internet', along with Rihanna, Kylie Jenner, and other real-life luminaries (Time, 2018). Appel et al. (2020) and Robinson (2020) believe that virtual influencers are the game changers in influencer marketing, whereby their influences are real even though they are fictional. According to HypeAuditor (2020), virtual influencers have nearly three times higher engagement rate than real human influencers, particularly on Instagram, with the primary audiences being women between 18 and 34 years old (44.97%). Majority of these primary audiences are identified as Generation Y, which is the dominating group on Instagram (Malaysian Communications and Multimedia Commission, 2020). Generation Y consists of the most influential consumers among other generational cohorts, with an estimated purchasing power of \$2.45 trillion worldwide (Park et al., 2021). They are also the significant driving force that propels social movements online (Duh and Thabethe, 2021). In Malaysia, more companies are expected to embrace the idea of virtual influencers in near future, following the footsteps of local and international brands such as AirAsia, PUMA, KFC, and Louis Vuitton to reach out these young consumers.

However, there is not much information that could be used as practical guideline. It is observed that recent studies mostly revolve around the influence between humans (Ashman et al., 2018; Boerman, 2020; Guan and Li, 2021; Jaitly and Gautam, 2021; Jiménez-Castillo and Sánchez-Fernández, 2019; Özbölük and Akdoğan, 2022; Silva et al., 2020; Torres et al., 2019). Some mention about virtual influencers as an emerging digital marketing trend (Appel et al., 2020; Kádeková and Holienčinová, 2018), but only a few of them investigate and discuss exclusively on virtual influencers (Arsenyan and Mirowska, 2021; Moustakas et al., 2020; Robinson, 2020; Silva Oliveira and Chimenti, 2021). It is still uncertain whether there would be any difference between real human and virtual influencers regarding their effects on Generation Y consumers. Multiple supports using different theories and methods are, therefore, required to understand this growing phenomenon in a more comprehensive and objective manner (Robinson, 2020; Silva Oliveira and Chimenti, 2021). To fill the research gap, this paper answers the call by Guan and Li (2021) to determine the key qualities for virtual influencers to succeed in influencer marketing. Our quantitative study identifies the significant factors that

influence Generation Y consumers' purchase intention using relevant ideas from Shimp's (2003) TEARS model and Ajzen's (1991) theory of planned behaviour (TPB), which were not explored in the context of virtual influencer marketing previously. Furthermore, we also took one step forward to look at the mediating effect of Generation Y consumers' attitudes towards virtual influencers, as well as the moderating effects of gender and persuasion knowledge in this study. The following are the research questions that we addressed:

- 1 Which are the most significant factors in influencing Generation Y consumers' purchase intention?
- 2 Will attitude mediate the relationship between the identified factors and Generation Y consumers' purchase intention?
- 3 Will gender and persuasion knowledge moderate the relationship between the identified factors and Generation Y consumers' purchase intention?

The rest of the paper is organised as follows. Firstly, a review of relevant literature and background theories is presented along with hypotheses and conceptual framework. Secondly, the research methodology is outlined, and followed by the results and discussion. Subsequently, the theoretical and managerial implications are provided. Finally, the limitations of this study and recommendations for future research are proposed.

2 Literature review and hypothesis development

2.1 Influencers, virtual influencers, and influencer marketing

Influencers are popular and active in the social space. Robinson (2020) defines influencers as individuals with high social status who are able to influence others using their words and actions. These individuals are authorities and trendsetters such as celebrities, public figures, bloggers, and experts whose opinions matter to their followers (Appel et al., 2020; Casaló et al., 2020; Duh and Thabethe, 2021; Farivar et al., 2020; Kádeková and Holienčinová, 2018; Knoll and Matthes, 2017). When collaborating with brands, influencers are responsible to increase brand awareness and help to convert their followers into consumers (Djafarova and Rushworth, 2017; Farivar et al., 2020; Jin et al., 2019; Kim and Kim, 2021). In the context of social media, they are individuals with significant follower base and they have the ability to promote brands, products, or services through engaging online interaction (Jaitly and Gautam, 2021; Kádeková and Holienčinová, 2018; Moustakas et al., 2020). Belanche et al. (2021) and Sheng et al. (2020) refer them as virtual friends that connect and inspire a niche group of followers with similar traits and interests. Followers generally relate better to these virtual friends on social media platforms because they are perceived to be more authentic (Jin et al., 2019). In other words, social media influencers are more effective in delivering persuasive marketing messages (Djafarova and Rushworth, 2017). It is no surprise that they have become the dominant information source about brands, products, and services nowadays (De Veirman et al., 2017; Jiménez-Castillo and Sánchez-Fernández, 2019).

With rapid and successive leaps in technology, the idea of virtual influencers emerges to revolutionise influencer marketing through blending physical and virtual realities.

Virtual influencers are social media influencers that do not exist in the real world (Robinson, 2020). They are created digitally by either an individual or a team of professionals using sophisticated computer software to resemble how real human influencers look, behave, and collaborate with brand owners and marketers for promotion on social media platforms (Moustakas et al., 2020; Robinson, 2020; Silva Oliveira and Chimenti, 2021). Despite having humanlike appearance, virtual influencers are not necessarily the avatars or digital representations of real human influencers. They are merely fictional characters that act as agents to entertain and communicate on behalf of the creators, brand owners, and marketers (Robinson, 2020). Unlike real human influencers, they do not have biases and they are scandal-free, which allow brand owners and marketers to have more freedom in creating their ideal brand ambassadors for the long run (Robinson, 2020; Silva Oliveira and Chimenti, 2021). This shows that virtual influencers are innovative in ways that align with the needs of many businesses.

The widespread use of social media has propelled influencer marketing to be the preferred method for companies to promote their brands, collect data from followers, and gain insights to improve their businesses (Antoniadis et al., 2019; Jaitly and Gautam, 2021; Özbölük and Akdoğan, 2022). Instagram is the top chosen social media platform for influencer marketing due to its inclusive platform design that enables anybody to become the centre of attention (Amitay et al., 2020). According to Amitay et al. (2020), influencers on Instagram contribute to better marketing effectiveness, which makes them the first choice of marketers (59%) compared to well-known celebrities (23%). Undeniably, influencer marketing is one of the fastest growing approaches to acquire new customers virtually via strategic brand-influencer partnership (Guan and Li, 2021; Kádeková and Holienčinová, 2018). The approach involves a process of identifying, researching, engaging, and assisting influencers who have the power to sway followers' purchase intention (Kádeková and Holienčinová, 2018; Moustakas et al., 2020). Purchase intention is the bridge between an individual's belief and his or her buying behaviour (Bleize and Antheunis, 2019). It is an individual's conscious plan to purchase from a brand (Spears and Singh, 2004). Both real human and virtual influencers work together with brand owners and marketers to create social media content that could influence their followers' purchase intention.

Native advertising is a content marketing strategy that blurs the line between editorial and commercial content. It takes place when the partnering influencers are paid to post and share branded content that are curated to match the look and feel of other content appearing on social media feeds (Kim and Kim, 2021). With the use of this strategy in influencer marketing, the followers are more likely to consume the branded content without realising it as a form of advertising (Boerman et al., 2017). Examples of branded content could be the posting on experience from events that are hosted by a brand, or having candid photographs to showcase the sponsored product that comes with brand's information in the captions. In general, social media users are open to persuasive influence as long as the source of influence is perceived to be genuine (Jin et al., 2019; Kim and Kim, 2021). This means that an effective communication in influencer marketing depends heavily on the influencer's attributes as brand endorser.

2.2 *TEARS model*

TEARS model presents five attributes that are instrumental in determining the effectiveness of a brand endorsement (Shimp, 2003). They consist of trustworthiness,

expertise, attractiveness, respect, and similarity. Firstly, trustworthiness is linked to consumers' perception on integrity and believability of a brand endorser. Secondly, expertise is associated with relevant knowledge, experience, and skill of the brand endorser in a particular field. Thirdly, attractiveness refers to his or her physical and behavioural qualities that are able to arouse consumers' interests. Subsequently, respect occurs when a brand endorser is being admired based on personal qualities and overall accomplishments. Lastly, similarity means the extent to which a brand endorser matches the consumers' characteristics such as their gender, age, and lifestyle. Among the five attributes, trustworthiness and attractiveness are crucial to an effective communication (Shimp, 2003). In addition, Ambroise et al. (2014) find that brand endorsers' attributes could be projected onto the endorsed brand to influence consumers' attachment to the brand and decision to purchase. As brand endorsers, virtual influencers are expected to hold desirable attributes that are similar to the real human influencers. However, unlike real human influencers, virtual influencers have neither real experience (expertise) nor social status (respect). While they could act as experts in a particular field with compelling background stories and content that are totally fabricated, it is still questionable whether they are authentic and can be trusted (Robinson, 2020). For this reason, we focused on the remaining attributes in the model, namely trustworthiness, attractiveness, and similarity. In particular, we used concepts such as parasocial interaction and perceived realism to elaborate the attribute of similarity, which were not explored in this model previously. Parasocial interaction involves a repeated exposure to media characters that creates an illusion of intimacy as if they are the audience's close friends in real life (Chung and Cho, 2017); whereas perceived realism evokes a sense of familiarity towards the realistic media content in the virtual world (Hall, 2017; Lee, 2004; Weber et al., 2021; Wright et al., 1994). The above-mentioned attributes are further explained in the following sections.

2.2.1 Parasocial interaction

Parasocial interaction addresses the tendency of an audience for having one-sided intimate bond with media characters that appear in fictional settings (Chung and Cho, 2017; Jarzyna, 2020). These media characters can be either real human influencers such as celebrities and public figures, or fictional characters in game and film (Chung and Cho, 2017; Jarzyna, 2020). Repeated exposure to the positive image and information that are disclosed by media characters can result in an increased attraction, which would then enhance the parasocial relationship (Chung and Cho, 2017). On social media platforms, parasocial interaction is made possible by the interactive features such as following, commenting, liking, and sharing (Chung and Cho, 2017; Ding and Qiu, 2017; Park et al., 2021). The followers' engagement in parasocial interaction begins with a psychological state of motivation that results from the act of following (Castillo-Abdul et al., 2022). Throughout the parasocial interaction, young followers enjoy receiving likes and positive comments particularly from someone they like and admire to make them feel good about themselves (Cuesta-Valiño et al., 2022). The good feeling would then encourage them to be more involved in the parasocial interaction. Moreover, young followers also share branded content with others to offer information that may be of use to them (Lee et al., 2019). According to Lee and Ma (2011), previous experience in socialising and sharing on social media platforms are the two most salient factors that influence an individual's sharing intention. All in all, the interactivity on social media helps to foster a deeper

connection between influencers and followers with similar traits or values (Chung and Cho, 2017; Ding and Qiu, 2017; Park et al., 2021). The strong bond that is formed via parasocial interaction helps to build perceived credibility of the influencers, which positively affects the followers' trust and purchase intention (Farivar et al., 2020; Hwang and Zhang, 2018; Reinikainen et al., 2020). This brings to the following hypothesis:

H1 Parasocial interaction with virtual influencer positively influences purchase intention.

2.2.2 Perceived realism

Perceived realism is a concept that involves a psychological state which occurs when an audience considers media content in the virtual world to be real (Hall, 2017; Lee, 2004; Wright et al., 1994). The media content may include texts, images, videos, and other interactive elements to form believable digital narratives (Castillo-Abdul et al., 2022). Weber et al. (2021) define perceived realism as the consumers' judgement about the degree of realism of the virtual environment in terms of virtual objects, sounds and scenes, as well as the credibility and plausibility of the story and its characters, and also naturalness and ease of interaction with virtual environment. The perceived reality in media content is important to facilitate persuasion (Cho et al., 2014; Hall, 2017; Hall, 2003). This explains why virtual influencers and their content are commonly designed to look convincing. They often appear in a realistic setting and showcase similar behaviours as their followers to create a sense of familiarity that is beneficial for building rapport (Arsenyan and Mirowska, 2021; Moustakas et al., 2020; Robinson, 2020; Silva Oliveira and Chimenti, 2021). While there are both cartoon and lifelike renditions of reality in the virtual worlds, it is still unknown whether the difference would affect consumers' purchase intention (Moustakas et al., 2020). This is because consumers are critical when interpreting the messages in media content (Castillo-Abdul et al., 2021). In view of the persuasive effect of realistic media content, we proposed that:

H2 Perceived realism of virtual influencer positively influences purchase intention.

2.2.3 Trustworthiness

According to Djafarova and Matson (2021), trustworthiness is the most important factor in determining credibility of an influencer. Credibility is the expression of consumer expectations pertaining to the reality of the advertising message (Logan et al., 2012). It refers to the amount of trust the consumers have when they judge the message (Cuesta-Valiño et al., 2020). In other words, there will be no trust without credibility. On social media platforms, the message from a credible source has the ability to change a message recipient's attitude, which represents the efficacy of the communication (Cuesta-Valiño et al., 2020; De Veirman et al., 2017; Miranda et al., 2021). Essentially, trustworthiness drives an effective communication via brand endorsement (Shimp, 2003). Having trust in influencers alike as credible brand endorsers is crucial because it increases the likelihood to purchase from the endorsed brands (Shimp, 2003). From here, we came up with the following hypothesis:

H3 Trustworthiness of virtual influencer positively influences purchase intention.

2.2.4 Attractiveness

Attractiveness builds up likeability (Gong and Li, 2017) that is beneficial to friendship formation (Groyecka et al., 2017), whereby it can be very useful for a brand endorser in making persuasion (Shimp, 2003). It is linked to the brand endorser's physical and behavioural appeals as well as the congruence with the brand (Gong and Li, 2017; Khong and Wu, 2013; Torres et al., 2019). From physical aspect, audiences are generally more sensitive to the eyes and lips because of their roles in drawing attention and creating impression through social communication (Bateson et al., 2006; Emery, 2000; Ibáñez-Berganza et al., 2019; Looser and Wheatley, 2010). For example, big almond-shaped eyes with a slightly upturned outer corner are more attractive than smaller eyes, and 1:1 upper to lower lip ratio is considered most aesthetically pleasing (Heidekrueger et al., 2017). However, the inconsistency of realism in anthropomorphic entities such as humanoid robots and humanlike computer-generated characters can trigger conflicting inferences regarding whether the entities are real, which result in the feeling of eeriness and negative impression (Arsenyan and Mirowska, 2021; Cheetham, 2017; MacDorman and Chattopadhyay, 2016). To minimise the risk, most well-known virtual influencers are designed to achieve high fidelity based on commonly accepted beauty standards. From behavioural aspect, it is attractive to have value-creating capabilities that contribute to a greater influence (Silva Oliveira and Chimenti, 2021). As brand endorsers, virtual influencers outperform real human influencers by having the advantages of not ageing and falling sick. The advantages enable them to stay 'forever young and healthy', so that they can consistently entertain and arouse their followers' interests (Robinson, 2020). This makes them highly suitable for brands that intend to attract the younger market in a youthful manner. We then developed the following hypothesis:

H4 Attractiveness of virtual influencer positively influences purchase intention.

2.3 Theory of planned behaviour

Ajzen's (1991) TPB posits that behavioural intention is driven by an individual's beliefs from three aspects, namely behavioural beliefs (attitude towards behaviour) that are linked to the beliefs regarding probable outcome of the behaviour; normative beliefs (subjective norm) that refer to the beliefs on standard expectations of significant others; and control beliefs (perceived behavioural control) that associate with the amount of control individuals perceive they have over performing the behaviour. The likelihood of engagement in behaviour increases when the intention is stronger (Ajzen, 1991). In other words, attitude, intention, and behaviour are interconnected (Aramendia-Muneta and Olarte-Pascual, 2019).

According to Baker and White (2010), young social media users with favourable attitudes towards engaging in frequent social media use (attitude towards behaviour) are more confident in their ability to access and use social media platforms (perceived behavioural control). However, when group norm was included in the model of Ajzen's (1991) TPB, subjective norm no longer emerged as a significant predictor of behavioural intention, wherein it provided a more comprehensive explanation on the role of social influence in predicting behavioural intention than subjective norm (Terry and Hogg, 1996; Terry et al., 1999). Instead of believing what significant others such as parents and teachers think they should be doing, the young social media users are influenced more by

what they perceive their friends to be doing (Baker and White, 2010). This explains why young social media users are increasingly using social media to gain normative approval from peer groups. Following and interacting with celebrities and other influencers alike such as the virtual influencers on social media platforms has become common among these groups. Despite this, it remains unknown regarding the effect of attitude towards virtual influencers on Generation Y consumers' purchase intention.

2.3.1 Attitude

Attitude, either positive or negative, generally relates to the tendency that an individual possesses in performing a behaviour based on affection and consideration (Ajzen, 1991). It is an individual's internal evaluation about something or someone. However, attitude is not equivalent to feelings. This is because feelings are transitory, whilst attitude is relatively enduring (Spears and Singh, 2004). Amitay et al. (2020) posit that consumers' lifestyle is strongly affected by their attitudes which comprise three elements, namely cognitive (knowledge and perception based on a combination of personal experience with attitude and information pertaining to the source); affective (personal feelings towards the brand or product); and behavioural (personal intention and response tendencies). These three elements do not need to occur at the same time, but they are the necessary building blocks to form consumers' attitudes towards a brand or product (Amitay et al., 2020). Individuals with favourable attitudes towards behaviour are more likely to show greater intention to perform that behaviour (Ajzen, 1991). In marketing, understanding consumers' attitudes provides insight to their behavioural intention (Belanche et al., 2021). Belanche et al. (2020) also point out that consumers' positive attitudes towards a product could influence their willingness to purchase. Previous study by Jaitly and Gautam (2021) indicates that customers' attitudes are greatly influenced by social media influencers because these influencers are able to spark positive responses in a niche segment with similar interests. Their online presence in specific market segments makes them a useful channel for brands to influence consumers' intentions and behaviours (Guan and Li, 2021). Since virtual influencers have highly similar roles as real human influencers on social media platforms, we proposed that:

H5 Attitude towards virtual influencer positively influences purchase intention.

Furthermore, both Amitay et al. (2020) and Lim et al. (2017) show that attitude also plays a significant role in mediating the consumers' purchase intention. When an individual holds attitude towards a particular advertiser (brand owners and marketers), the attitude tends to have an impact on both the individual's perception of the particular advertising stimulus (MacKenzie and Lutz, 1989) and the brand perception resulting from this exposure (MacKenzie et al., 1986). Considering virtual influencers as the 'faces' of advertisers, the following hypotheses are formulated:

H6 Attitude towards virtual influencer mediates the relationship between parasocial interaction and purchase intention.

H7 Attitude towards virtual influencer mediates the relationship between perceived realism and purchase intention.

H8 Attitude towards virtual influencer mediates the relationship between trustworthiness and purchase intention.

H9 Attitude towards virtual influencer mediates the relationship between attractiveness and purchase intention.

2.4 Gender

Gender refers to the sexual identities of male and female. Xue et al. (2020) state that the behaviours of males are more influenced by cognition, whereas females are more affected by emotion. The specific interests and knowledge that are associated with gender's social roles also act as a guide to their judgements (Kim et al., 2007). Additionally, males and females with different tendencies to perform different social roles would have different consumption needs (Tanrikulu, 2019). In fact, Xue et al. (2020) postulate that gender has moderating effects on the influence exerted by brand perception on purchase intention due to this difference. According to Lin et al. (2019), gender is a key to moderate consumers' evaluative judgements in online purchase intention. In comparison to males, females have significantly stronger moderating effect on purchase intention in using e-commerce shopping during COVID-19 pandemic (Arifin et al., 2022). Gligor et al. (2022) also find out that females display higher levels of purchasing power. We noticed different consumption needs of males and females result in different purchase intentions, hence, the following hypotheses:

H10 Gender moderates the relationship between parasocial interaction and purchase intention.

H11 Gender moderates the relationship between perceived realism and purchase intention.

H12 Gender moderates the relationship between trustworthiness and purchase intention.

H13 Gender moderates the relationship between attractiveness and purchase intention.

2.5 Persuasion knowledge

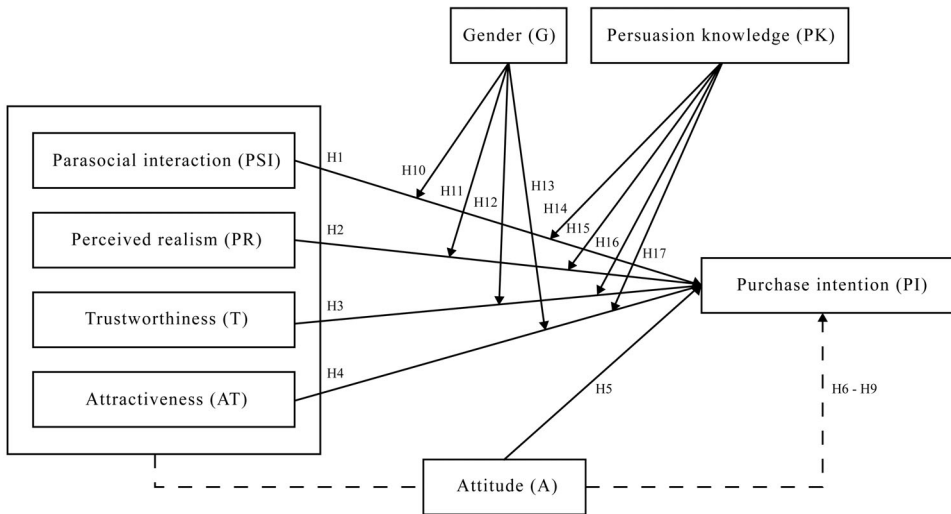
Persuasion knowledge refers to consumers' general understanding on a particular subject matter before the persuasion encounters (Friestad and Wright, 1994). It is a prior knowledge that affects consumers' evaluation of an influencer's motives before making assumption about the influencer's behaviour and coping with his or her persuasion attempts (Eisend and Tarrahi, 2021). Consumers would have different attitudes and responses to a persuasion attempt based on how well they understand about it (Kim et al., 2018; Ryu and Park, 2020), which can be objective and subjective (Ham and Nelson, 2016). Persuasion knowledge helps both marketers and consumers to identify and better understand the available offerings (Eisend and Tarrahi, 2021). This is also applicable to virtual influencers who are considered as agents of influence that offer emotional value (Robinson, 2020). Perception (subjective) towards an agent of influence is drawn based on how much the consumers think they know from their memory recall (objective) that is "not affected by personal feelings and opinions" [Manika et al., (2018), p.46]. Considering the impact of persuasion knowledge on consumers' behavioural outcomes, we proposed that:

H14 Persuasion knowledge moderates the relationship between parasocial interaction and purchase intention.

- H15 Persuasion knowledge moderates the relationship between perceived realism and purchase intention.
- H16 Persuasion knowledge moderates the relationship between trustworthiness and purchase intention.
- H17 Persuasion knowledge moderates the relationship between attractiveness and purchase intention.

The following presents our conceptual framework that is constructed based on the above-mentioned hypotheses.

Figure 1 Conceptual framework



3 Method

3.1 Research design

This study adopts a deductive research approach using quantitative method to test the hypotheses based on existing theories. An online survey was shared with respondents via Google Form across social media platforms such as Facebook, WhatsApp, and LinkedIn, starting from 12 March 2021 until 25 February 2022. Virtual snowball sampling method was used to identify a few potential subjects in Malaysian Generation Y population before asking them to recruit more people within the population to participate in the online survey. This is because potential participants were hard to find due to location boundaries at the time of conducting the study during COVID-19 pandemic. In order to avoid bias, we reached out to the identified subjects from different ethnicities within the population. In fact, there was no sensitive question item in the questionnaire that challenges the respondents' gender orientation as well as religious and political beliefs. The measurement items were adopted and adapted with modifications to fit the context of

this study (see Table 1). All responses were measured on five-point Likert scales (1 = 'strongly disagree', 5 = 'strongly agree').

Table 1 Measurement items

<i>Variables</i>	<i>Labels</i>	<i>Statements</i>	<i>References</i>
Parasocial interaction	PSI1	I am interested in this influencer.	Adapted from Davis and Perkowski (1979)
	PSI2	I would follow this influencer.	
	PSI3	I would comment about this influencer.	
	PSI4	I would share the post by this influencer.	
	PSI5	I would talk about this influencer.	
Perceived realism	PR1	This influencer's behaviour is real.	Adapted from Poeschl and Doering (2013)
	PR2	This influencer's posture is real.	
	PR3	This influencer's gesture is real.	
	PR4	This influencer's facial expression is real.	
	PR5	This influencer's emotion is real.	
Attractiveness	AT1	This influencer is attractive.	Adopted from Khong and Wu (2013)
	AT2	This influencer is classy.	
	AT3	This influencer is good-looking.	
	AT4	This influencer is stylish.	
	AT5	This influencer is appealing.	
Trustworthiness	T1	This influencer is dependable.	Adopted from Khong and Wu (2013)
	T2	This influencer is honest.	
	T3	This influencer is reliable.	
	T4	This influencer is sincere.	
	T5	This influencer is trustworthy.	
Attitude	A1	The brand-influencer collaboration is favourable.	Adapted from Khong and Wu (2013) and Spears and Singh (2004)
	A2	The brand-influencer collaboration makes me feel good.	
	A3	The brand-influencer collaboration makes me feel pleasant.	
	A4	The brand-influencer collaboration is relevant to me.	
	A5	The brand-influencer collaboration is logical.	
Purchase intention	PI1	I would consider the product as my first choice.	Adapted from Khong and Wu (2013)
	PI2	I would encourage relatives or friends to consume the product.	
	PI3	I would recommend the product to someone.	
	PI4	I would say positive things about the product.	
	PI5	I would consider buying the product.	

3.2 Sample size

A total of 450 validated responses from Malaysian Generation Y respondents (48% male, 52% female) aged 25 to 40 were collected, with 73% of them being active Instagram users. As the concept of virtual influencers is relatively new to the market in Malaysia, only 52% of the total respondents have prior knowledge about virtual influencers. However, obtaining responses from those with and without prior knowledge of virtual influencers could create a coherent and reasonable picture of the respondents' view without bias. Most of these respondents are between 25 and 30 years old (77%). Chinese (56%) constitute the highest percentage in terms of ethnicity, followed by Malay (30%), Indian (12%), and others (2%). Majority of them (65%) are bachelor's degree holders, and 30% people with monthly income range of RM 2,000 and below.

4 Results

4.1 Descriptive statistics

The means, standard deviations, reliabilities, and bivariate correlations of the variables are reported in Table 2. All variables are found to have moderately high mean scores ranging between 2.49 and 3.82. They also show a high degree of reliability with α -values greater than 0.7. Among them, trustworthiness and purchase intention have the highest α -values. It is found that the bivariate correlations are statistically significant ($p < 0.001$). Attitude has the strongest positive relationship with purchase intention, whereas perceived realism has the weakest positive relationship with purchase intention. The rest of the variables (parasocial interaction, attractiveness, and trustworthiness) moderately correlate with purchase intention. Since the highest R-value is more than 0.7, it can be assumed that there is strong correlation among the variables.

Table 2 Means, standard deviations, reliabilities, and bivariate correlations summary (N = 450)

Variables	M	SD	α	1	2	3	4	5
1 PSI	2.49	1.02	0.89					
2 PR	3.01	0.96	0.91	.34***				
3 AT	3.82	0.88	0.91	.37***	.37***			
4 T	2.71	0.86	0.94	.29***	.38***	.30***		
5 A	3.08	0.93	0.91	.48***	.34***	.49***	.55***	
6 PI	2.83	1.04	0.94	.47***	.33***	.48***	.52***	.69***

Notes: Mean scores in the study are based on five-point Likert scales (1–5).

PSI – parasocial interaction; PR – perceived realism; AT – attractiveness;

T – trustworthiness; A – attitude; PI – purchase intention; M – means;

SD – standard deviations; α – Cronbach's alpha.

* $p < .05$, ** $p < .01$, *** $p < .001$.

4.2 Multiple regression analysis

The results of hierarchical multiple regression analysis are reported in Table 3. Step 1 tested the influences of parasocial interaction, perceived realism, attractiveness, trustworthiness, and attitude on purchase intention; whereas step 2 examined the influences of parasocial interaction, perceived realism, attractiveness, and trustworthiness on attitude. All the variables form 74% of the variance in purchase intention, with $F(5, 444) = 107.23$, $p < 0.001$. From step 1, the influences of parasocial interaction, attractiveness, trustworthiness, and attitude on purchase intention are found to be highly significant ($p < 0.001$), except for perceived realism. Besides, attitude is confirmed to be a strong mediating variable, showing β -value of 0.44. From step 2, the strongest determining factor that significantly influences attitude is trustworthiness with β -value of 0.39, followed by parasocial interaction and attractiveness with β -values of 0.26 and 0.27 respectively. The weakest determinant is perceived realism with β -values of 0.00 and 0.01 when tested on purchase intention and attitude respectively, and the p-value of 0.81 indicates its low significance in this study.

Table 3 Hierarchical multiple regression analysis summary (N = 450)

<i>Steps and variables</i>	<i>B</i>	<i>SE</i>	β	<i>R</i>
Step 1				.74***
PSI	.15	.04	.15***	
PR	.00	.04	.00	
AT	.18	.05	.15***	
T	.23	.05	.19***	
A	.50	.05	.44***	
Step 2				.68***
PSI	.24	.04	.26***	
PR	.00	.04	.01	
AT	.29	.04	.27***	
T	.42	.04	.39***	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4 presents the hypotheses acceptance summary. Interestingly, attitude is found to be a highly significant mediator in influencing the Generation Y consumers' purchase intention ($p < 0.001$). In fact, the two strongest determining factors that significantly affect Generation Y consumers' attitude are parasocial interaction and attractiveness, with p-value of 0.02 for both. Therefore, H1, H4, H5, H6, and H9 are accepted. Since perceived realism and trustworthiness have p-values of 0.27 and 0.11 respectively, both of their hypotheses, namely H2 and H3 are rejected. Their relationships that are mediated by attitude, namely H7 and H8 are no longer applicable and they are rejected altogether. Moreover, our study finds that gender and persuasion knowledge only have significant moderating effects in the relationship between parasocial interaction and purchase intention, with β -values of -0.37 and -0.60 respectively, but they are insignificant towards other factors. To be specific, males with persuasion knowledge show a direct negative and weak effect ($\beta = -0.00$, $SE = 0.07$); males without persuasion knowledge show a direct positive and weak effect ($\beta = 0.24$, $SE = 0.06$); females with persuasion

knowledge show a direct positive and weak effect ($\beta = 0.13$, $SE = 0.06$); and females without persuasion knowledge show a direct positive and moderate effect ($\beta = 0.37$, $SE = 0.06$). Therefore, H10 and H14 are accepted, while H11, H12, H13, H15, H16, and H17 are rejected.

Table 4 Hypotheses acceptance summary

<i>Hypotheses</i>		<i>p</i>	<i>Decisions</i>
H1	PSI with VI positively influences PI.	.02	Accepted
H2	PR of VI positively influences PI.	.27	Rejected
H3	T of VI positively influences PI.	.11	Rejected
H4	AT of VI positively influences PI.	.02	Accepted
H5	A towards VI positively influences PI.	.00	Accepted
H6	A towards VI mediates the relationship between PSI and PI.	.00	Accepted
H7	A towards VI mediates the relationship between PR and PI.	N/A	Rejected
H8	A towards VI mediates the relationship between T and PI.	N/A	Rejected
H9	A towards VI mediates the relationship between AT and PI.	.00	Accepted
H10	G moderates the relationship between PSI and PI.	.05	Accepted
H11	G moderates the relationship between PR and PI.	.30	Rejected
H12	G moderates the relationship between T and PI.	.92	Rejected
H13	G moderates the relationship between AT and PI.	.07	Rejected
H14	PK moderates the relationship between PSI and PI.	.00	Accepted
H15	PK moderates the relationship between PR and PI.	.76	Rejected
H16	PK moderates the relationship between T and PI.	.59	Rejected
H17	PK moderates the relationship between AT and PI.	.84	Rejected

Note: VI – virtual influencer; PSI – parasocial interaction; PR – perceived realism; AT – attractiveness; T – trustworthiness; A – attitude; G – gender; PK – persuasion knowledge; PI – purchase intention.

5 Discussion

5.1 Theoretical implications

This study helps to understand the phenomenon of virtual influencer marketing by using Shimp's (2003) TEARS model and Ajzen's (1991) TPB. Apart from the general applications on real human influencers, the key ideas of Shimp's (2003) TEARS model and Ajzen's (1991) TPB are proved to be applicable to virtual influencers even though these fictional characters do not exist in real life. The significant effect of parasocial interaction shows that virtual influencers can influence Generation Y consumers' purchase intention via interactivity on Instagram. Our study confirms the previous findings (Castillo-Abdul et al., 2022; Chung and Cho, 2017; Ding and Qiu, 2017; Farivar et al., 2020; Hwang and Zhang, 2018; Lee and Ma, 2011; Park et al., 2021; Reinikainen et al., 2020), and specifically, proves that parasocial interaction with virtual influencers has similar positive effects as real human influencers. However, perceived realism did not emerge as a significant factor, which contradicts to the findings by Cho et al. (2014) on

its facilitating effect in persuasion. While creating realistic content that resonates with young consumers may improve likeability (Arsenyan and Mirowska, 2021; Moustakas et al., 2020; Robinson, 2020; Silva Oliveira and Chimenti, 2021), however, not making them to purchase would then defeat the purpose of virtual influencers as brand endorsers. As an extension to Shimp's (2003) TEARS model, the attribute of similarity shall be improved through parasocial interaction instead of perceived realism when the model is applied in the context of virtual influencer marketing. Likewise, the insignificance of trustworthiness also reveals a main difference between human and non-human influencers, contradicting to previous findings that revolve around real human influencers (Cuesta-Valiño et al., 2020; De Veirman et al., 2017; Miranda et al., 2021; Shimp, 2003). This is a discovery made on top of Shimp's (2003) TEARS model, whereby trustworthiness did not appear to be the essential attribute for virtual brand endorsers, as opposed to the human counterpart.

On the other hand, attitude towards virtual influencer is confirmed to have significant mediating effect on Generation Y consumers' purchase intention. This is a new finding in the scope of virtual influencer marketing, as previous findings only focused on real human influencers (Amitay et al., 2020; Lim et al., 2017). The results of this study imply that males and females have different propensities in interacting with virtual influencers. Females are more likely to hold positive attitudes towards virtual influencers. The positive attitudes are able to spark their desires to purchase from the brands that are endorsed by the virtual influencers. Even though virtual influencers do not exist in the real world, they still have considerable influence on young followers who approve and praise their way of life on social media (Robinson, 2020). Furthermore, this study also sheds light on the roles of gender and persuasion knowledge as moderators, which were not studied previously in the context of virtual influencer marketing. It is observed that females without persuasion knowledge, who are aged 25 to 30 with income less than RM 2,000 from the lower tier of Generation Y, are more involved in parasocial interaction with virtual influencers. In comparison, females tend to have a stronger moderating impact than males, and both of their effects appear to be higher when they lack persuasion knowledge of the virtual influencers.

5.2 Managerial implications

Generation Y consumers in Malaysia may not trust virtual influencers as brand endorsers, but they still interact with these 'fake humans' due to similar traits and interests. This implies that the perceived role of virtual influencers shall be shifted from being a brand endorser to someone like a friend who understands the consumers in order to influence their purchase intention. With a shift in perception, they are more likely to consume the branded content from virtual influencers without realising it as a form of advertising. In fact, brand owners and marketers are advisable to continue creating content that is entertaining and informative because it helps to foster favourable attitude towards the source of influence (Aramendia-Muneta and Olarte-Pascual, 2019). There shall be a balance between branded and non-branded content to make sure followers on Instagram do not get overwhelmed. In other words, virtual influencers are still valuable to brands in Malaysia, especially when they target Malaysian females aged 25 to 30 with income less than RM 2,000 who have no prior knowledge of the virtual influencers.

Furthermore, character design helps virtual influencers to stand out from the crowd (Moustakas et al., 2020). It is important for brand owners and marketers to craft the look and persona of virtual influencers from physical and behavioural aspects. From physical aspect, the design of the eyes requires careful attention because a dead person's eyes make computer-generated characters less attractive and they may look scary (MacDorman and Chattopadhyay, 2016). From behavioural aspect, it is suggested to humanise virtual influencers by injecting an engaging personality to strengthen the bond with followers. According to Chung and Cho (2017), the use of communication in conversational style is powerful for building intimacy with followers. Additionally, being open with the followers is a proven way to enhance intimacy in parasocial interaction (Copeland et al., 2021). However, openness matters only for influencers whom they familiar with (Copeland et al., 2021). Our study shows that successful virtual influencers shall be:

- 1 widely recognised for entertaining yet informative content
- 2 physically attractive with commonly accepted attributes
- 3 humanised to make real connection with followers via parasocial interaction.

In short, brand owners and marketers could consider these key factors when using virtual influencers on Instagram.

5.3 Limitations and recommendations for future research

As this study only provides a narrow perspective regarding the influences of virtual influencer marketing on Generation Y consumers, future researchers are recommended to look at other generational cohorts to compare the similarities or differences in findings. Besides, marketing effectiveness of virtual influencers in terms of actual conversion rates cannot be investigated in this study due to scarce information. As a suggestion, more extensive studies are required to determine whether the key factors (parasocial interaction and attractiveness) have similar significant influences on actual purchase or otherwise. Out of the four dimensions, gender and persuasion knowledge only have significant moderating effect on the relationship between parasocial interaction and purchase intention in this study, which means that other possible moderators such as ethnicity and level of education may be considered in future research.

6 Conclusions

Overall, we extended theories from Shimp's (2003) TEARS model and Ajzen's (1991) TPB in the context of virtual influencer marketing. To the best of our knowledge, our study is one of the few that has investigated the influences related to the fast-growing phenomenon of virtual influencer marketing, and we were the first ones to examine the key factors that influence Generation Y consumers' purchase intention in Malaysia using quantitative method.

As virtual influencers are still very new to Malaysian market, it is important that a fair representation of the respondents is captured since their views of the virtual influencers could be different. Though we observed that only 52% of the total respondents have persuasion knowledge about virtual influencers, obtaining responses from those with and

without persuasion knowledge of virtual influencers could create a coherent and reasonable picture of the respondents' view without bias.

The results of this study reveal three major findings. Firstly, parasocial interaction, attractiveness, and attitude have a strong direct influence on purchase intention. More specifically, this study has shown that Generation Y consumers respond favourably to virtual influencers if they are attractive and appealing. Additionally, results also indicate the importance of parasocial interaction with virtual influencers in generating a positive attitude hence instilling a certain relationship between them. The more intense the relationship, the more inclined are the Generation Y consumers to follow, comment, and share about the virtual influencers and increasing the chances of buying the endorsed brand or product.

Secondly, the results of this study also show that attitude mediates the relationships of parasocial interaction and attractiveness with purchase intention. The results suggest the prominent role of attitude in facilitating a favourable or good feeling about the virtual influencers, which could lead to a higher possibility of purchasing the brand or product.

Finally, it can be concluded that gender and persuasion knowledge have moderating roles in the relationship between parasocial interaction and purchase intention. In tandem with previous literature, females are more likely to hold favourable attitudes towards having a social connection with virtual influencers. Moreover, it can be observed that females without persuasion knowledge of virtual influencers are more involved in parasocial activities such as following, making comments, sharing posts, and talking about the virtual influencers.

According to Appel et al. (2020) and Robinson (2020), young social media users enjoy interacting with virtual influencers regardless of the commercial affiliations. This makes virtual influencers an attractive and valuable intellectual property for brand owners and marketers that wish to expand their brand presence across social media platforms. It is noteworthy that these computer-generated characters outperform real human influencers in many ways. For example, they are scandal-free (Robinson, 2020; Silva Oliveira and Chimenti, 2021), plus they have better user engagement via parasocial interaction on Instagram (HypeAuditor, 2020), and there is more flexibility in creative storytelling (Appel et al., 2020; Moustakas et al., 2020). Above all, virtual influencers are always ready to 'work' and they are 'immortal'. They are here to stay and will continue to disrupt the convention of traditional influencer marketing that relies on real human influencers (Robinson, 2020). In sum, the key takeaways serve as a guideline for both academics and industry practitioners in order to have a better understanding on the phenomenon and plan effective strategies using virtual influencers.

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