

Exploring the Impact of Virtual Influencers on Consumers' Purchase Intention in China: An

Investigation of Perceived Source Credibility

The mediating role of parasocial interaction

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ABSTRACT

Virtual influencers in China are undergoing an accelerated phase of expansion. Many brands cooperate with virtual influencers to promote their products and create their own virtual influencer to represent their brand. It leads a competing with human influencers on Chinese social media platforms. The feature of social media in China such as social commerce gives virtual influencers opportunities to sell promoted products. However, most studies researched how human influencers affect consumers' purchase intention. There are only a few studies that examined the topic of virtual influencers. Source credibility theory and parasocial interaction were performed in this study to investigate the impact of virtual influencers on purchase intention. Therefore, this study examines how the perceived source credibility of virtual influencers affects purchase intention and how parasocial interaction mediates this relationship.

A quantitative study with an online survey design was conducted to answer the research question. The data was collected by distributing a survey on social media and recommendations among people. 150 qualified answers were collected in the study. The results showed that only two factors of source credibility – trustworthiness and attractiveness were fully confirmed and that they positively affect consumers' purchase intention. Regarding the role of parasocial interaction, the effect of trustworthiness on purchase intention was fully mediated by it while it partially mediates the effects of attractiveness on purchase intention. This study adds to the understanding of the current influencer marketing research field, particularly from the virtual influencers. Knowing why and how virtual influencers can pique customers' interests is becoming more and more important as brands continue to favour them. Besides, this study provides valuable insights for marketers who intend to leverage virtual influencers as promotional agents in their future marketing endeavours.

KEYWORDS: *Virtual influencer, purchase intention, source credibility, parasocial interaction, influencer marketing*

Table of contents

ABSTRACT.....	3
1. Introduction.....	6
2. Theoretical Framework.....	10
2.1 Virtual Influencers.....	10
2.1.1 The Rise of Virtual Influencers.....	10
2.1.2 The Alternative to Human Influencers.....	11
2.2 Purchase Intention and Influencer Marketing.....	12
2.2.1 Purchase Intention.....	12
2.2.2 Influencer Marketing.....	12
2.3 Source Credibility Theory – Its suitability in the context of the Chinese virtual influencer market.....	13
2.3.1 Trustworthiness.....	14
2.3.2 Expertise.....	15
2.3.3 Attractiveness.....	15
2.4 Parasocial Interaction.....	16
2.4.1 Parasocial Interaction through Source Credibility.....	17
2.5 Conceptual Model.....	19
3. Methodology.....	20
3.1 Justification.....	20
3.2 Research Design.....	20
3.3 Population and Sampling.....	20
3.3.1 Population.....	20
3.3.2 Sampling.....	21
3.4 Operationalization.....	21
3.4.1 Data Cleaning and Screening.....	22
3.4.2 Data Analysis.....	22
3.5 Measurements.....	23
3.5.1 Source Credibility.....	23
3.5.2 Purchase Intention.....	23
3.5.3 Parasocial Interaction.....	24
3.6 Validity and Reliability.....	24
4. Results.....	25
4.1 Sample Description.....	25
4.2 Factor Analysis and Reliability Analysis.....	26
4.2.1 Purchase Intention (PI).....	26
4.2.2 Source Credibility.....	27
4.2.3 Parasocial Interaction (PSI).....	28
4.3 Hypothesis Testing.....	29

4.3.1 Source Credibility and Purchase Intention	29
4.3.2 Parasocial Interaction as a mediator	29
4.4 Result Summary.....	31
5. Conclusion and Discussion.....	31
5.1 Discussion	32
5.2 Theoretical Contribution	33
5.3 Practical Implications	33
5.4 Limitation and Reflection	35
5.5 Future Research	36
6. Reference List	37

1. Introduction

The market for virtual influencer in China is undergoing an accelerated phase of expansion. A steady stream of virtual influencers created by Chinese technology companies, commercial brands, advertising and marketing agencies, etc., are competing with real human influencers on Chinese social media platforms, such as *RED*, *Weibo* and *TikTok* (also called *Douyin*), for vying market share (Miao, 2021). To give more explanation of the platforms mentioned here, *TikTok* is a short video-sharing platform that introduced a shopping feature within its application in China in 2020. *Red* bears a resemblance to Instagram and Pinterest with a dash of Taobao (the largest e-commerce platform in China), and it has become one of the most popular social media platforms for Chinese users, particularly in the lifestyle domain (Borak, 2018). *Weibo* operates similarly to Twitter, and is therefore, commonly referred to as a Twitter-like platform. It enables its users to share multimedia content such as images, videos, and music, thereby enhancing user engagement and enjoyment. These social media platforms in China give opportunities to human influencers and virtual influencers to attract more followers and engage in brand and product promotion. According to iiMedia Research (2022), the virtual influencer industry in China reportedly reached 107.49 billion yuan in 2021, and it is anticipated to reach 640.27 billion yuan in 2025. It indicates a strong growth trend for this industry. Hence, virtual influencers in China would be an interesting topic to analyse.

Prior to delving into the advantages of virtual influencers, it is necessary to provide a brief overview of the contextual messages surrounding e-commerce and social media in China. This contextualization is deemed necessary to facilitate an understanding of the reasons behind the strong growth trend of virtual influencers in China. Chinese Internet users spend nearly half of their online time browsing social media per day (ITC, 2023). A high mobile penetration enables Chinese people to surf the Internet and engage in social media easily, flexibly, and almost anywhere and anytime (ITC, 2023). ITC (2023) concluded that the integration of social media into individuals' daily routines has become increasingly close, encompassing both online and offline activities. The alteration in consumer behavior has resulted in a shift in the manner in which brands engage with their target audience, encompassing factors such as location, timing, and way of consumption. The integration of social media platforms and e-commerce has facilitated a seamless purchasing experience for consumers, who can conveniently buy products or services within the social media platform without the need to use another APP or website to buy those products or services (ITC, 2023). The B2C industry in China commonly believes that a purely social media campaign has gradually disappeared due to the closed-loop marketing management approach adopted by various social media platforms. It means that socializing features and e-commerce must be combined together for effective campaign implementation. This is also seconded by McKinsey & Company (2022) in its article that "browsing and shopping directly on social media is a core feature of e-

commerce in China". This feature represents that social commerce has become significantly popular and achieved substantial success in China over the past decades (McKinsey & Company, 2022). The most common way used by B2C brands is to cooperate with social media influencers. Take skincare promotion as an example, influencers post videos on social media platforms to show their daily skincare routine, demonstrating the advantages of a particular product and explaining the reasons for their favour towards it like a friend. If consumers have purchase intention, they can buy this product directly within the platform. Given this, it could be believed that each influencer in China has the opportunity to impact the purchasing intentions of consumers, as the latter can conveniently make purchases within social media platforms. Influencers have the ability to improve the exposure of the products and brands, thereby triggering consumers' purchase intention. According to Statista (2022), it is estimated that the economy of influencer marketing in China is expected to increase to seven trillion yuan by 2025, and a survey indicated that 81% of respondents who follow at least one influencer had at some point bought the goods the influencer recommended (Influencerhunter, 2022).

Recently, influencer marketing in China has reached a new stage by introducing virtual influencers on social media. They are models generated by technology: operation team give them complete life trajectories and personality. In addition, they have several distinct advantages that make them an attractive option for brands seeking to cooperate. For example, they can remain available at all times, work 24 hours a day and even participate in some business activities (Tech, 2022). It also means that virtual influencers have the ability to show different promoting activities at the same time in different locations without travelling or time costs, which human influencers are unable to accomplish. This implies that choosing virtual influencers as promoters could help brands save costs (Appel et al., 2020). In general, virtual influencers are a more sustainable, controllable, and cost-effective alternative to human influencers due to their impeccable appearance, body shape comparable to supermodels, and age that remains constant (Nox, 2022). Furthermore, brands express concerns regarding the potential harm to their reputation when engaging in endorsement agreements with influencers who display questionable conduct on social media (Reinikainen et al., 2021), and virtual influencers are considerably less prone to cause these scandals (The Economist, 2022). The utilization of AI technology can effectively mitigate human errors, minimize potential public relations risks, and enhance the brands' ability to control influencers in promoting (Nox, 2022). Another reason for promoting a virtual influencer is to change or reshape the brand's image to give people a young impression (Jiemian, 2021). Many brands find it difficult to communicate with "people" directly, so the company can create or cooperate with a virtual influencer to act as a carrier of the brand's culture and values (Sands et al., 2022). Thus, virtual influencers have the ability to serve as a viable option for brands seeking to establish

effective communication channels that facilitate connections between brands and consumers.

According to Miao (2021), the processes involved in establishing and introducing real-life and virtual influencers are similar. This involves the creation of social media accounts, live streaming, and data optimization. Currently, virtual influencers are continuously receiving support from their fans and are being treated with the same level of reverence as real-life influencers, particularly in the context of social media comments, endorsements, and participation in live commerce (Buer, 2022). It means that consumers not only follow virtual influencers but their purchase intention may also be affected by them. Besides, iiMedia Research (2023) also reported that the positive impact of promoting products or services through virtual influencers gradually increased, 80% of its survey's respondents will increase their purchase intention on products or services because of virtual influencers' promotion. Many studies have already examined how real-life influencers affect consumers' purchase intention and the benefits of cooperating with influencers (Ashraf et al., 2023; Masuda et al., 2022; Li & Peng, 2021; Yang & Ha, 2021; Lu et al., 2014); however, it is still unclear that whether the effects of virtual influencers on affecting purchase intention is the same as that of human influencers. According to Miao (2021) and Buer (2022), virtual influencers could be alternatives to human influencers. Therefore, it would be interesting to explore whether virtual influencers exert a comparable influence on the intention to purchase.

According to Brown & Hayes (2008) and Yilmazdoğan et al. (2021), influencers, as users of social media platforms, could gain credibility within a particular domain on these platforms and then they have the ability to affect other social media users' behaviour. Because influencers serve as a trustworthy source for consumers and demonstrate expertise in a particular area (Evans et al., 2017). Consequently, their influence will arise from a credible source so that they can significantly influence the value of social media advertising (Shareef et al., 2019) and consumers' purchase intention (Babić et al., 2016). Thus, Source Credibility Theory is often used to demonstrate that consumers are more likely to make a purchase when they believe the source from influencers to be more trustworthiness, expertise, and attractiveness (Weisueller, 2020; Yilmazdoğan et al., 2021; Muda & Hamzah, 2021). As mentioned above, the virtual influencer can be seen as similar to the human influencer, so this study assumes that the effect of the virtual influencer is also similar, meaning that consumers are more likely to purchase items that virtual influencers have recommended if they think the source is credible. Therefore, the purpose of this study is to explore how virtual influencers and consumer purchase intention are related.

RQ 1: To what extent does the source credibility of virtual influencers affect consumers' purchase intention in China?

Due to repeated exposure to social media, consumers can have a high frequency of interactions with influencers in addition to perceiving the credibility of sources. Sokolova & Kefi

(2020) suggested that an increase in parasocial interaction can lead to a higher likelihood of consumer purchases. Lee & Lee (2022) and Gong (2020) have provided support for the notion that parasocial interaction can positively affect consumers' purchase intention, particularly in the context of the current social media environment. Lou & Kim (2019) stated that parasocial interaction play a mediation role of the relationship between source credibility and purchase intention. This is partially consistent with Zakiyah & Hartini's (2020) viewpoint that parasocial interactions between influencers and followers are characterized by attractiveness, expertise, and trustworthiness, which facilitates open communication between influencers and their followers (Yuan et al., 2016). Consequently, followers may transfer their preference to the brand and enhance their purchase intention (Gong 2020; Penttinen et al. 2022). According to Molin & Nordgren (2019), virtual influencers are seen as having a better capacity to be accessible both online and in person, which is demonstrated to have a beneficial impact on the facilitation of parasocial interaction as it boosts their attractiveness. The research makes the case that parasocial interaction may provide insightful data for comprehending the relationship between virtual influencers and followers in light of this.

RQ 2: How does parasocial interaction mediate the relationship between source credibility and consumers' purchase intention in China?

This study will employ source credibility theory and parasocial interaction as its theoretical framework to investigate the impact of virtual influencers on purchase intention in China. It is hypothesized that virtual influencers can influence consumers' purchase intention, provided that consumers perceive the virtual influencers as credible sources. Moreover, it is anticipated that parasocial interaction may serve as a mediator in this relationship. Regarding practical implications, an increasing number of brands are utilizing virtual influencers in their marketing campaigns. This study provides valuable insights for marketers who intend to leverage virtual influencers as promotional agents in their future marketing endeavours. The study aims to indicate the influence of virtual influencers on consumers' purchase intentions, specifically in relation to source credibility and para-social interaction, thereby enhancing their comprehension of the subject matter.

The study is organized in the following format. Initially, a comprehensive analysis of virtual influencers, source credibility, and parasocial interaction will be presented through a literature review. Subsequently, the hypothesis derived from the comprehensive analysis of existing literature will be put forth. The methodology used in this study, research design, respondent recruitment, and data management procedures, will be explained in the following section. Next, all results will be displayed. Moreover, the results will explicate the theoretical contribution and potential implications in practical contexts. Additionally, the limitations and potential direction for future research will be addressed at last.

2. Theoretical Framework

2.1 Virtual Influencers

2.1.1 The Rise of Virtual Influencers

The academic world has not yet reached a consensus on the definition of virtual influencers. This is primarily attributed to the continuous evolution of digital technology, which has resulted in the emergence of various types of virtual influencers (Hong & Wang, 2022). According to the summary by Xiong & Huang (2022), virtual influencers entered the human world as early as the 1980s, when the Japanese anime "Super Time Fortress" first used a virtual singer, Akemi Hayashi, as the singer of an episode, opening the era of virtual influencer 1.0. During the onset of the 21st century, the conventional practice of hand-painting was progressively supplanted by computer-generated imagery (CGI) and motion capture technologies. This led to the emergence of virtual influencers who entered the 2.0 stage of exploration. In recent times, the advancement of novel technological trends such as biotechnology, virtual reality, and artificial intelligence have propelled the development of virtual influencers' technology from mere digitization of appearance to a more sophisticated integration of behavior and cognitive intelligence. It means that the virtual influencer 3.0 era has arrived (Xiong & Huang, 2022). According to Morozov (2014), the distinction between "real" and "virtual" is rapidly blurred in current digital society, which is defined primarily through an internet-centric culture, in contrast to the previous two stages (Seymour et al., 2019; Miyake, 2023).

Nowadays, a virtual influencer is described as an AI-controlled entity that is portrayed as an interactive, real-time rendered entity in a digital environment, whether or not it resembles a human (Sands et al., 2022). Virtual influencers possess public identities and narratives akin to human influencers, resulting in heightened interaction between influencers and users in the online sphere (Hanus & Fox, 2015). According to Choudhry et al. (2022), virtual influencers possess a distinctive blend of visual allure, enigmatic qualities, and imaginative narrative that draws in their followers, setting their content apart from that of human influencers. In addition, virtual influencers are defined as digital influencers who are associated with an online celebrity and are generated through the use of software and algorithms to simulate human behavior (Thoms & Flower, 2021). According to Arsenyan & Mirowska (2021), virtual influencers have resorted to social media platforms to interact with users and integrate human networks, owing to the widespread use of virtual agents across various industries. A virtual influencer might have a sizable social media following and be recognised as "a reliable tastemaker in one or more domains" (De Veirman et al., 2017).

When talking about virtual influencers in China, virtual influencers, who were created out of

nowhere, without any reference to real life, but they have a “real” complete life story, were springing up in recent years. Moreover, they are also engaged in diverse domains of social media. In conclusion, this study's definition of a virtual influencer is a nearly completely fictitious figure with a distinct personality whose purpose is to give the impression that they are real.

2.1.2 The Alternative to Human Influencers

The proliferation of virtual influencers has resulted in their increased engagement on various social media platforms. Mirowska & Arsenyan (2023) proposed that virtual influencers should replicate the emotional strategies employed by human influencers on social media in order to establish connections with users. Some scholars proposed that virtual influencers could be an alternative to real human influencers (Appel et al., 2020; Mirowska & Arsenyan, 2023). There are some reasons for it. First, virtual influencers avoid the limitations of real humans. Artificial intelligence algorithms and powerful computational capabilities are thought to confer a greater social media presence upon virtual influencers compared to their human influencers (Appel et al., 2020). To be more specific, compared with human influencers, virtual influencers have the ability to be present in any location, at any time, and interact with anyone, thereby affording brands a risk-free level of control within limited budgets (Drenten & Brooks, 2020). Arsenyan & Mirowska (2021) also argued that virtual influencers would not feel loneliness or anxiety so that they could manage their social media account regularly. Second, when choosing to contact virtual influencers, consumers frequently are aware of the substance of the prepared photographs being promoted, unlike when interacting with real human influencers, where consumers face the danger of being duped by posed photos and advertising (Hanus & Fox, 2015). When engaging with virtual influencers, Pan et al. (2017) suggested that consumers not only can know the features of fashion and lifestyle but also allows trendiness, creative, and open-mindedness. Third, when virtual influencers are utilized to promote a product or brand, consumers may experience a higher sense of perceiving ad novelty, differentiation, and future orientation (Jang & Yoh, 2020; Franke et al., 2022). Therefore, according to Lou et al. (2022), virtual influencers are considered effective in building brand image and improving brand awareness.

According to Qin & Zheng (2020), the management of virtual influencers in China is becoming increasingly comparable to that of human influencers. This indicates that virtual influencers are now active in social media through different ways, such as pictures, short videos and live-streaming. This phenomenon also proved that virtual influencers could be an alternative to human influencers in China. Given this, this study is expected that virtual influencers have a similar influence on purchase intention to that of human influencers.

2.2 Purchase Intention and Influencer Marketing

2.2.1 Purchase Intention

The concept of purchase intention refers to the inclination of a consumer to acquire a particular product or service, which is determined by their subjective and comprehensive evaluations of it (Dodds et al., 1991). It is a deliberate intention to either make an effort or plan to purchase a branded product (Spears & Singh, 2004). According to Fishbein & Ajzen's (1975) research, the most reliable indicator of an individual's behavior is the degree to which they intend to engage in that behavior. Nowadays, the intentions of consumers to make purchases have emerged as a crucial factor that marketing managers can use to predict future sales and assess the potential impact of their marketing strategies on consumers' purchasing behaviour (Vicki, 2014). Spears & Singh (2004) have posited that the attitudes of consumers towards influencers exert a noteworthy impact on their intention to purchase.

2.2.2 Influencer Marketing

In terms of the concept of influencer, it is not new in marketing. It is a way to drive consumer awareness of a brand (Scott, 2015), and is one of the main factors to impact consumers' purchasing behavior in traditional media long before the popularity of social media (Masuda et al., 2021; Erdogan, 1999). It is widely believed that the utilization of celebrity endorsement in advertising can result in more positive opinions compared to non-celebrity endorsements (Atkin & Block, 1983; Parsons, 1963).

The emergence of social media has led to a notable shift in the impact of social media influencers and traditional celebrities on the purchasing behaviour of consumers. According to Djafarova & Rushworth (2017), social media influencers hold a greater impact over consumers' purchasing behaviour than traditional celebrities. This is attributed to the ability of social media influencers to foster close relationships with their followers by sharing authentic experiences and product preferences, as well as actively engaging in interactions (Li & Peng, 2021). Additionally, social media influencers are also people who have become well-known on various social media platforms, as opposed to traditional celebrities who rose to prominence through their performances in acting, music, or other artistic fields (Khamis et al., 2016). However, the current advancement of social media has led to a blurring of the distinction between influencers and traditional celebrities, as individuals can now assume both roles simultaneously (Koay et al., 2022).

The social media influencer demonstrates how to use promoted products in real-life scenarios like a friend, while also providing a comparative analysis of the product's efficacy pre- and post-use. This recommendation gives the consumers a strong sense of reality and brand association (Li & Peng, 2021). Furthermore, the aforementioned recommendation behaviors establish the

influencers as experts in specific fields and enhance the source's credibility, as they appear to incorporate the promotional product into their real-life daily routines. In other words, these behaviours increase the credibility of the source, meaning that this person or entity is believable and trustworthy (AlFarraj et al., 2021). Colliander & Dahlén (2011) argued that this is an effective way to persuade consumers to purchase. Virtual influencers have attracted lots of attention from brands and Chinese social media platforms, exhibiting high levels of activity and catering to diverse brands' requirements. According to Guo et al. (2021), the incorporation of new and innovative technology has the potential to appeal to consumers, thereby enhancing the level of engagement between influencers and consumers. Consequently, virtual influencers may have greater potential to stimulate purchase intention. Hence, it is essential to examine the potential effects of virtual influencers on the purchase intention of consumers.

2.3 Source Credibility Theory – Its suitability in the context of the Chinese virtual influencer market

The younger generation's behaviour is evolving as a result of increased time spent using digital devices and ongoing influences from a variety of sources, including influencers (Croes & Bartels, 2021). According to Chiu & Ho (2023), this situation gave rise to influencer advertising, which has become one of the most popular marketing tactics, particularly with the emergence of social media Influencers. Partnering with influencers is done to increase the effectiveness of how messages are communicated through advertisements (Chiu & Ho, 2023). Meanwhile, peer-to-peer advertisements on social media are largely proven to be perceived as more credible than traditional media (Lou & Yuan, 2019; Djafarova & Rushworth, 2017; Munnukka et al., 2016), and the perceived credibility of social media advertising has been found to influence its value (Shareef et al., 2019). In addition, research on influencers' credibility frequently draws on the source credibility theory at the academic level (Lou & Yuan, 2019; Munnukka et al., 2016; Ohanian, 1990). To be more specific, research has demonstrated that a credible influencer typically elicits a positive impact on the way consumers perceive a product or service (Goldsmith et al., 2000). Following this theoretical tradition, this study argues that source credibility theory would also be applicable to the rising virtual influencers for the following reasons: firstly, the majority of virtual influencers in China gradually have lots of commercial brand promotion after debuted a while, primarily in the form of photographs and short videos on the social media platform, which is the same for traditional human influencers on social media in the past decades. Secondly, high levels of physical resemblance to humans in human-like virtual influencers could elicit the same reactions as conventional human influencers (Cornelius et al., 2023).

The source credibility theory has a long history in business research but also developed in recent decades in the context of influencer marketing in social media. According to Hovland et al.

(1953), source credibility theory emphasises the need for the communicator to be credible in order for a message to persuade the receiver. Ohanian (1990) also stated that credibility refers to a communicator can positively affect the acceptability of a message. In light of social media, the three most important factors in source credibility theory are trustworthiness, expertise, and attractiveness (Weismueller et al., 2020). In commercial contexts, the benefits of source credibility relate to the positively increased effectiveness of marketing communication in brand awareness, customers' attitudes toward marketing activities and brands (Ohanian, 1990; Munnukka et al., 2016), as well as their purchase intention (Gunawan & Huarng, 2015). Research by Jin & Muqaddam (2019) indicates that influencers can use their influence to increase the consumers' perception of credibility towards the brand.

2.3.1 Trustworthiness

According to the source credibility model, trustworthiness describes the level of confidence in the source's intention to communicate the most valid assertion that the consumer believes (Hovland et al., 1953). This factor is considered to be one of the primary determinants of a message's effectiveness (Hovland et al., 1953). Perceiving trustworthiness of influencers plays an important role in drawing consumers' behaviour, such as purchase intentions (Yuan & Lou, 2020). Therefore, appearing authentic is an important aspect of trustworthiness (Leban & Voyer, 2020). If an influencer is deemed trustworthy by their followers, the information they provide regarding product endorsements is likely to be perceived as credible (Cheung et al., 2008). According to Muda & Hamzah's (2021) summary of a large body of research, trustworthiness is directly related to persuasiveness and message validity. When a source is seen to be trustworthy, it will be simpler and more successful to change consumers' attitudes than when the source is seen as untrustworthy (Pornpitakpan, 2004). Specifically, the more trustworthy the influencer, the more effective their opinion is to the recipient of the message (Miller & Baseheart, 1969, as cited by Muda & Hamzah, 2021). Moreover, there is a positive correlation between the perceived trustworthiness of influencers and the levels of brand credibility and brand attitude (Wang & Scheinbaum, 2018). This, in turn, leads to increased purchase intention, irrespective of the media type used for advertising (Wang & Scheinbaum, 2018). Djafarova & Rushworth (2017) also noted that consumers are more likely to follow new or unknown social media influencers, provided that they appear genuine. In terms of virtual influencers, Wibawa et al. (2022) argued that the future trend of virtual influencers would become more and more trustworthy through a series of marketing strategies.

H1a: Perceived trustworthiness of virtual influencers positively affects the consumers' purchase intention.

2.3.2 Expertise

While trustworthiness refers to the communicator's level of assurance in their intention to convey the claims that the communicator believes to be most true, expertise relates to the extent to which a communicator is seen as a source of credible claims, (Hovland et al., 1953). Perceived expertise is another key factor in consumers' willingness to buy (Chetioui et al., 2020; Pornpitakpan, 2004). In addition, consumers on social media are more willing to buy products recommended by influencers who have some professional knowledge (Weismueller et al., 2020).

The level of expertise demonstrated by influencers is primarily determined by their knowledge and experience, which they then convey to their intended audience (Patzner, 1983, as cited by Li & Peng, 2021). To be considered an expert, an influencer must be informed about a subject, possess the necessary skills, or hold a prominent title in order to be regarded as an expert (Gass & Seiter, 2014). Expertise is described as the familiarity, understanding, and experience that a person acquires through continuous work in the same area of knowledge (Gass & Seiter, 2014). That person is thought to produce more persuasive messages than non-expert sources due to expectations that the data will be accurate or reliable (Muda & Hamzah, 2021). Similarly, Xiong et al. (2018) also examined that influencers with high expertise are more convincing than those with little expertise. When reviewing virtual influencers, there is a conflict of the effect of perceiving the expertise of virtual influencers on purchase intention. Some arguments, for example, argued that expertise has no significant influence on purchase intention because virtual influencers do not actually use the products they promote (Chiu & Ho, 2023). However, virtual influencers have access to a wealth of expert knowledge from their research and experience because they have a professional team running their operations. Because virtual influencers are similar to human influencers, this study made the assumption that consumers may perceive expertise from them and that this perception could impact their purchasing decisions.

H1b: Perceived expertise of virtual influencers positively affects the consumers' purchase intention.

2.3.3 Attractiveness

Obanian (1990) expanded on the source credibility hypothesis by including attractiveness, which is related to physical appearance, personality, and athletic ability. This was done in response to the growth of advertising methods. These are all crucial determinants of endorsement, commercial success and elements of total influencer attraction (Yuan et al., 2016). An attractive influencer is more likely to increase consumers' acceptance of the endorsed product (Lim et al., 2017). Accordingly, attractiveness plays a major role in how influencer endorsement affects consumer purchasing behavior (Guyer et al., 2019; Trampe et al., 2010; Erdogan, 1999). Van der Waldt (2011) also suggested that appealing promoter are more likely to motivate consumers to

make purchases. As a result, the power of influencer endorsement on consumer purchasing behavior is mostly influenced by attractiveness (Kahle & Homer, 1985, as cited by Weismueller et al., 2020).

The idea of attractiveness serves as the foundation for interpersonal connections and as a framework for social interactions (Kim & Park, 2023). In terms of virtual influencers, Moustakas et al. (2020) suggested that creating compelling characters for virtual influencers that include conflicts, aspirations, and problems helps to make them more human and strengthens their 'emotional bond' with their followers. Because an influencer's physical traits and qualities—such as knowledge, beauty, wholesomeness, psychographic traits, and sportsmanship—are intrinsically tied to how customers view their attractiveness (Onu, 2019). According to Torres et al. (2019), consumers' intentions to make purchases are influenced by how attractive influencers are when promoting products or services. Therefore, this study also expects that virtual influencer' attractiveness will influence consumers' buying behaviour.

H1c: Perceived attractiveness of virtual influencers positively affects the consumers' purchase intention.

2.4 Parasocial Interaction

Influencers play an essential role in providing a mediated and indirect communication channel between brands and followers (Yuan & Lou, 2020). Because marketing goals, such as influencing brand perception and pushing products, are accomplished through interaction between the influencers and their followers, indirect communication through influencers is its feature (Booth & Matic 2011). Therefore, it will be interesting to research the parasocial interaction between virtual influencers and their followers. Understanding the interaction between influencers and followers is therefore crucial.

Parasocial interaction (PSI), according to Horton & Wohl (1956), refers to the imaginary social interactions that users have with media personas. These media person gives the sense of companionship to media users, not only the entertainment (Rubin et al., 1985). In other words, this relationship—which is one-sided—occurs when audiences are regularly exposed to a media personality and grow to feel empathy, friendship, and companionship with them (Horton & Wohl, 1956). Parasocial interaction was first created in response to TV characters (in movies, television shows, operas, etc.) that the audience progressively comes to treat as real persons with whom they have an emotional connection so that audience creates an imagined interpersonal relationship with the TV characters. (Horton & Wohl, 1956; Rubin et al., 1985). Social media platforms nowadays, for instance, allow for two-way parasocial interactive contact between influencers and followers in contrast to traditional media (Kassing & Sanderson, 2009). PSI may serve as a mechanism by which

social media exerts an effect on its followers (Gong & Li, 2017), and it is facilitated by social media (Aw & Labrecque, 2020). It gives followers more chances to have illusory human-to-human interactions with influencers on social media (Chung & Cho, 2017). Moreover, the perception of interactivity can be driven by open communication, timely responses and addressing users directly by name in response to their comments, which can further improve PSI levels (Labrecque, 2014). Bond (2016) also argued that followers may feel stronger PSI when they experience a mutual relationship with the influencers they followed; for instance, influencers will reply to their comments or invite them to interact. Even if followers hardly participate in the conversation, it will still give the impression of friendship (Lueck, 2015).

Once they have interacted with a PSI with the same media persona on multiple occasions, the audience will continue to develop what is known as a parasocial relationship (PSR). PSR forges a more enduring connection between the media figure and the audience and presents closeness as a "real" human connection (Dibble et al., 2016). According to Hartmann (2017), PSI and PSR can reinforce one another because, if users maintain a favorable relationship with a mediated other, they may have more powerful parasocial interaction when they come into contact with the other in the media. Thus, parasocial interaction may typically be integrated into the structure of a parasocial relationship from this perspective. PSI and PSR have traditionally been used interchangeably to characterise an ongoing relationship between celebrities and followers (Giles, 2002). Although PSI and PSR were initially developed within the context of traditional mass media, it is believed that they are also applicable to people's interactions with influencers in social media environments (Breves et al., 2021). The reason is that social media influencers frequently self-disclose private information, promote extreme brevity, and provide excellent engagement alternatives.

2.4.1 Parasocial Interaction through Source Credibility

As mentioned above, parasocial Interaction is essential for understanding the important role of influencers on social media, as argued by Yuan & Lou (2020). In addition, the social media source credibility of influencers has a direct and positive impact on the parasocial interaction between followers and influencers (Chung & Cho 2017; Yuan et al. 2016), and the credibility of influencers is increased by link building with the community (Baudier et al., 2023). Gong (2020) also confirmed that parasocial interaction, which is given by influencers in the context of influencer marketing, has a favorable effect on brand credibility. Lou & Yuan (2019) also stated that source credibility is one of the key indicators of the strength of parasocial relationships. Studies from several aspects also prove the relationship between source credibility and parasocial interaction. Schiappa et al. (2007) stated that consumers may pay more attention to influencers' news and engage in parasocial interact with them if they sense credibility from such influencers. Kashif Mahmood et al. (2023)

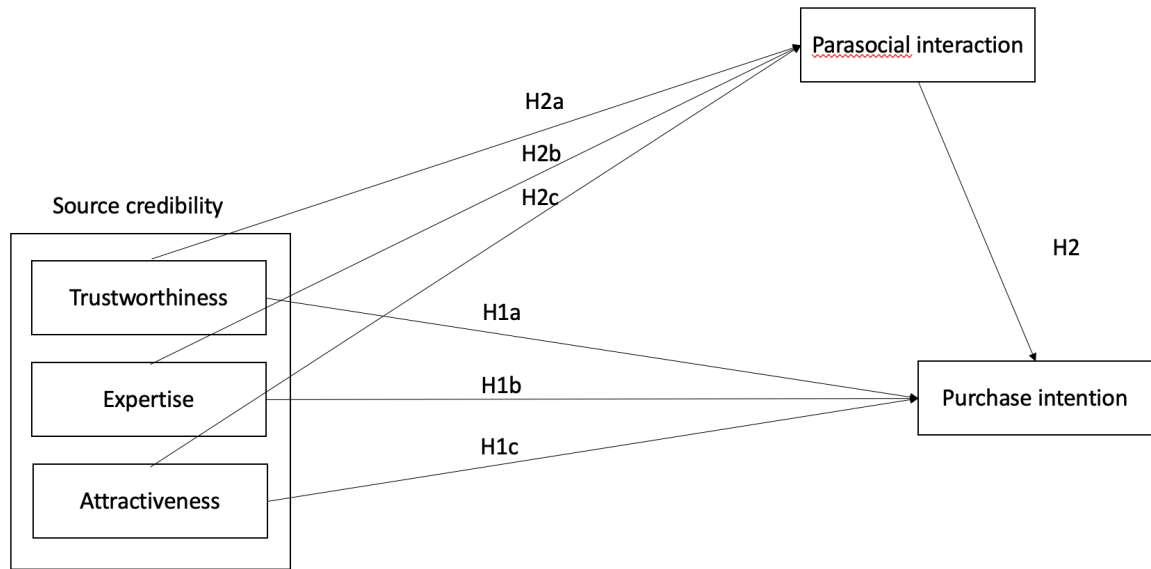
mentioned that if customers interact with influencers more frequently, they will become more aware of how they behave on social media and would be more likely to trust them. In addition, customers increasingly take into account influencers' opinions or expertise on particular goods and services (Hartmann & Goldhoorn, 2011).

Following the light of commercial background that this study focuses on, Jin & Phua (2014) demonstrated that one of the crucial elements in determining whether a marketing campaign is successful is whether fans are interested in and willing to purchase the products recommended by influencers. Meanwhile, studies found that PSI increases the consumers' purchase intention in the context of social media (Lee & Lee, 2022; Gong, 2020), and Gong & Li (2017) endorsement effects can be promoted by the credibility of sources in the context of parasocial interactions between followers and influencers., which also supported by Lou & Kim (2019) that the relationship between source credibility and purchase intention is mediated by parasocial interaction. Because consumers are likely to carry over their perception of a brand's credibility, the trustworthiness of influencers has been proven to be positively correlated with brand credibility (Wang & Scheinbaum, 2018). Similarly, Gong (2020) also found that PSI will not only increase follower's favor toward the influencers but will also transfer their favour to the brand, and will lead to improve purchase intention (Penttinen et al., 2022).

In the context of virtual influencers, a virtual influencer not only plays the influencer's role but also have different occupations and life experience that help attract followers and ease communication with them. Besides, they will also appear crying, sharing daily life or enjoying food on social media. Moreover, virtual influencers go beyond form or appearance, and the behaviour of VIs sometimes evokes a wider range of emotions among followers (Batista da Silva Oliveira & Chimenti, 2021). To some extent, it partially argues that these virtual influencers and real human influencers have no discernible moral differences (Robinson, 2020). In particular, Lou and Yuan (2019) found that attractive influencer is more effective in improving consumers' brand trust, which in turn enhances consumers' willingness to buy. There are also virtual influencers with lighter humanisation however, this study focuses on the most humanised influencers. Therefore, this study argues that consumers who believe virtual influencers are more credible will report a stronger parasocial interaction, which in turn increases buy intent for products advocated by influencers.

H2: Parasocial interaction mediates the relationship between a) trustworthiness, b) expertise and c) attractiveness of source credibility and consumers' purchase intention.

2.5 Conceptual Model



3. Methodology

3.1 Justification

The purpose of this study is to examine how virtual influencers affect consumers' purchase intention through perceiving source credibility and parasocial interaction. In order to achieve this goal, this study derives new claims and insights from the generally accepted existing theories about the relationship between source credibility, parasocial interaction and influencers. In addition, this study wants to examine how virtual influencers affect consumers' purchase intention in China. Therefore, the quantitative method was selected as the research method in this study. It not only can find a representative sample from a population that can be generalised to a population (Babbie, 2014), but also can enable for in-depth investigation of general patterns and statistical relationships between various social factors (Babbie, 2014). This is also a preferred method for answering research questions to get real responses from consumers in China. The data collected through this study have the potential to improve awareness about how consumers' purchase intention is affected by virtual influencers and can provide more details to marketers in practice.

3.2 Research Design

Given that the focus of this investigation pertains to the purchasing intentions of customers, an online survey was used in this study as a highly advantageous instrument for the researcher to amass a substantial volume of data. According to Matthews & Ross (2010), surveys are a prevalent method for collecting substantial amounts of data from research participants that can be conveniently analyzed. Besides, researchers are able to analyze the behavior from large amount of people and present this result in an accurate way through the survey. Conducting an online survey is a cost-effective and straightforward method of data collection that can be easily analyzed through the utilization of SPSS [version]. The survey is provided to participants to enable them to complete it on their preferred device, in a setting of their choice, and at a time that suits them best. Thus, the features of this approach is suitable for the aim of this study – investigating the relationship among purchase intention, perceiving source credibility and parasocial interaction in China. In addition, the survey designed a pre-testing phase by a number of people before officially distributing, in order to identify and address any potential ambiguities or unclear phrasing. Both pre-test survey and official survey were done by Qualtrics.

3.3 Population and Sampling

3.3.1 Population

In terms of population strategy, the purpose of the current study is to look at Chinese consumers' purchase intentions; thus, the survey's sample was made up of Chinese or people who live in China. Both scenarios might be potential customers in the Chinese market. 95.1% of

followers of virtual influencers are between the ages of 18 and 37, according to iiMedia Research (2022). As a result, the study's filter age range for participants is 18 to 37 years old. Moreover, participants should have at least one interaction experience with virtual influencers, such as liking, commenting, or following virtual influencers on social media. In addition, at least 150 valid responses were aimed to be obtained.

3.3.2 Sampling

The data collection period in 2023 was from 6 April to 10 May. The present study used convenience sampling, voluntary sampling and snowball sampling approaches as the chosen sampling methods. Participants were allowed to recommend individuals who might be interested in taking part in this group through snowball sampling, which enabled researchers to learn the features of a population (Goodman, 1961). The survey was also posted on social media in China, such as *WeChat* and *QQ*, by sharing the QR code and website link with the brief introduction of the study. Regarding this, people can decide by themselves whether they want to participate in this study. Therefore, the voluntary sampling approach was equally appropriate in this situation. Besides, convenience sampling was also appropriate in this study because researcher also asked some people met in the life to complete the survey on the topic. Again, the information would be gathered from population members who are willing to participate in the study and express their ideas (Stratton, 2021). The primary data utilised in this study was collected via a Qualtrics survey to collect responses by using convenience and snowball sampling approaches. The online survey has both English and Chinese version. It was derived from English to Chinese because this study mainly focuses on consumers in China.

3.4 Operationalization

The survey's goal was made clear to participants before it started. The information contained details regarding the aim of the study, how long it would take, whether or not participation was voluntary, data privacy, and emails from the researchers. This study offered a brief definition of virtual influencers that this study focused on before the participants began answering the questions. Next, participants answered three screening questions to double-check whether they met this study's goal. To be more specific, participants were informed that all data would be collected anonymously and used only for academic purposes before being asked if they agreed to these terms and wanted to proceed. If they disagreed with terms given, they were brought straight to the end of the survey. Moreover, there were several filter questions after participants agreed with all terms in the introduction part. First, participants were asked whether they are age between 18 - 37 years old. Second, participants need to meet the criteria that either come from China or

currently live in China. Third, participants were also required to have at least one interaction experience with virtual influencers, such as liking, commenting, or following virtual influencers on social media. If participants did not meet the above conditions, they were moved immediately to the end of the survey. After the screening, the study also offered multiple choices of virtual influencers in China to ask participants who is their most familiar virtual influencers, and also give them a choice that they could fill in other names. Before entering next step, the study asked participants to “imagine a virtual influencer that you are most familiar with to answer all the following questions”. It means that participants were instructed to remember this memory while completing the survey. Participants then answered questions relating to their purchase intention when virtual influencers recommended a product or service. According to their choice of purchase intention, participants were then asked how they perceived the source credibility (attractiveness, trustworthiness and expertise) of the virtual influencer. Furthermore, participants were reminded that they needed to imagine the virtual influencer with whom they had once interacted (such as commenting, liking and reposting) with them to state their feeling of parasocial interaction. In addition, participants can also choose if they want to respond to demographic questions about age, education level and gender at the end. Finally, participants were debriefed and thanked. The survey took around 5 minutes to complete.

3.4.1 Data Cleaning and Screening

The data collected on Qualtrics was analyzed by SPSS, a popular statistical tool for data analysis. First, to improve the study's internal validity, incomplete and error data were cleansed. Therefore, incomplete and those who failed to pass filter questions were removed from the data set. In addition, some respondents who did not fill in their age within the targeted age group were also removed from the data set although they completed all questions. Second, the data was reorganized, and the code was reversed before officially analysing the data.

3.4.2 Data Analysis

After getting a clean version, frequencies analysis in SPSS was used for analysing demographic questions. For the three scales analyzing (purchase intention, source credibility and parasocial interaction), factor analysis was performed here because each scale contains at least three items and the sample size reached 150. In addition, the reliability test was performed for each factor. It was decided to create new variables by calculating the mean of each items of purchase intention, source credibility (trustworthiness, attractiveness and expertise) and parasocial interaction, respectively. These new variables would be used to analysis in the following steps. In order to analyse the relationship among the three variables in the conceptual model, regression analysis was

used in the SPSS. For example, H1 stated the relationship between source credibility and purchase intention, and multiple regression was performed to test the hypothesis. In this case, the regression analysis could show if the independent variable source credibility can predict the dependent variable purchase intention. Afterwards, parasocial interaction was added to the model as a control variable to test the mediation by running different regression tests. Furthermore, the Sobel test was used here to double check whether parasocial interaction mediates the effect of source credibility on the purchase intention.

3.5 Measurements

As illustrated in the theoretical part, this study assumed that parasocial interaction has a mediation role of the relationship between source credibility and purchase intention. Therefore, this study would use the measures below to determine the relationship among them. These measures were assessed using a 7-point Likert scale (1=strongly disagree, 7=strongly agree). According to Finstad (2010), it has been proven that the 7-point Likert scale would be more accurate in measuring responses and be better to reflect the respondents' true thinking. Therefore, this study used a 7-point Likert scale in the survey.

3.5.1 Source Credibility

According to its definition, as discussed in section 2.3, the concept of Source Credibility is about how a credible influencer can persuade consumers through communication messages (Hovland et al., 1953; Ohanian, 1990). *Trustworthiness*, *expertise* and *attractiveness* were three important factors in source credibility regarding social media (Weismueller et al., 2020). The scale used in this study was adapted by Munnukka et al. (2016), which was originally from Ohanian (1990). The three components – trustworthiness ($\alpha = .89$), expertise ($\alpha = .82$), and attractiveness ($\alpha = .85$) in Munnukka et al. (2016) showed high reliability. Each dimension contains four items. For instance, when measuring *trustworthiness*, items include “I feel the virtual influencer is honest” and “I consider the virtual influencer is trustworthy”. Regarding *attractiveness*, “I think the virtual influencer is good looking” and “I consider the virtual influencer very stylish” were included. As for *expertise*, items like “I feel the virtual influencer is competent to make assertions about the product” and “I consider the virtual influencer as an expert on the product” belong here.

3.5.2 Purchase Intention

Purchase intention was measured through a 4-item developed by Taylor & Baker (1994) and Putrevu & Lord (1994). The scale includes a reversed question that investigates the purchase intention of recommended products with a stronger agreement with each item. The participants

were asked regarding the probability of their willingness to purchase the products or services promoted by influencers., including “I will consider purchasing that stuff next time when I need it” and “It is likely that I will buy that recommended stuff”. Some recent studies also use this scale to analyse the relationship between purchase intention and online recommendation from influencer (Rahmi et al., 2017; Lu et al., 2014). As discussed in section 2, virtual influencer is the alternative to human influencer, and the ultimate goal of this study is to find out how virtual influencers affect consumers’ purchase intention. Therefore, this 4-item scale can also be used here.

3.5.3 Parasocial Interaction

The parasocial interactions scale was initially created within the framework of traditional mass media (Rubin & McHugh, 1987). However, some items within the scale may not be applicable to the context of social media (such as “I look forward to watching my favourite soap opera character on tomorrow’s episode”). Thus, some authors adapted the items to analyse social media influencers and parasocial interaction. In this study, Lee & Jiang (2013)’s 7-item was chosen to measure parasocial interaction because it has already shown strong reliability in their study $\alpha = .95$ (Lee & Jiang, 2013). Participants were asked to image a virtual influencer, and one of the items would be “XX made me feel comfortable as if I was with a friend.”

3.6 Validity and Reliability

In research, validity and reliability are crucial. Since it is impossible to obtain perfect validity and reliability, this section will quickly explain how this study employed various methods to improve them.

According to Heale & Twycross (2015), validity refers to the accuracy of whether the result of the study does represent the hypothesis. To enhance validity, the scale chosen in this study was based on established studies and also used by several researchers, and each scale contains several items or dimensions in the measurement. This study also used snowball sampling method, which allowed this study to reach a wider audience through referrals. Although the validity of the probability sampling method could be stronger, it is difficult or sometimes even impossible to realize in the research (Babbie, 2014). A certain degree of sampling bias would be considered when using a non-probability sampling method.

Reliability is defined as the consistency of the measure (Heale & Twycross, 2015). The first way to enhance the reliability of this study is that most arguments and studies used here have been peer reviewed and have received many citations (Thoms & Flower, 2021; Arsenyan & Mirowska, 2021; Lou & Yuan, 2019; Munnukka et al., 2016; Ohanian, 1990; Hovland et al., 1953). Another way to improve reliability is that proven scales were used in this study, which was also used in previous

literature and had high reliability. In order to strengthen the reliability, incomplete and error answers were removed from the data set.

4. Results

This part is about reporting the data results after analysing through SPSS.. This section begins with a sample description, followed by factor analysis and reliability analysis. The results of hypothesis testing was shown at last.

4.1 Sample Description

This survey, which was used to gather data, received a total number of 311 ($N = 311$) responses. In terms of data cleaning purpose, it was decided to only include the data from participants who completed all questions of source credibility, parasocial interaction and purchase intention in the following research. Furthermore, the survey did not force respondents to answer demographic questions such as age, gender, and education. If participants fill in the age out of 18 – 37, then their data would also be cleaned. Therefore, $N = 150$ was included in this study after cleaning the data.

In terms of age, the study involved 147 participants ($N = 147$) who provided their age information, and the average age was 26 years old ($SD = 3.30$). The participant with the oldest age was 35, and the person with the youngest age was 20. Doctoral degrees were the highest level of education (2.0%) that participants gained, followed by master's degrees (46.0%), bachelor's degrees were most frequently mentioned (47.3%), some colleges but no degree (2%), high school graduates (2.0%), and one participant did not answer the education. The majority of the participants came from China (98.7%), with only two participants from other countries (Brazil and the Netherlands) but reside in China now. Meanwhile, participants are currently living in 14 ($N = 14$) different countries, but most participants are currently living in China (68.7%), and some are living in the Netherlands (16.0%), France (2.7%), Australia (2.0%), and Britain (2.0%). Moreover, there are 67.3% of female participants ($N = 101$), 30% of male participants ($N = 45$), and 1.3% of non-binary participants ($N = 2$) in this research. Again, demographic questions were not forced to answer; thus, two participants chose not to answer the gender question. According to the participants who responded to the question about who are the most familiar virtual influencers in China, Yexi Liu¹ and AYAYI² showed their popularity in participants' minds, with 50.3% and 39.3%, respectively. Ling³ was ranked in the top three, with 27.6%. Xiang Kong⁴ was less recognised by participants, with

¹ A virtual influencer named Yexi Liu, who is defined as a "virtual beauty vlogger."

² A fashion virtual influencer has tapped by lots of luxury and fashion brands.

³ A lifestyle virtual influencer which combines traditional Chinese aesthetics with modern fashion.

⁴ A virtual influencer was debuted with three endorsements in China

only 10.3%. In addition, 18.6% of participants also chose others to give different answers, such as Aespa⁵ and A-soul⁶.

4.2 Factor Analysis and Reliability Analysis

4.2.1 Purchase Intention (PI)

The 4 Likert-scale-based items were subjected to confirmative factor analysis using principal components extraction with a fixed one factor, with an eigenvalue above 1 (eigenvalue of 2.50), $KMO = .76$, $\chi^2 (N=311, 6) = 238.72$, $p < .001$. In the factor analysis, the KMO was used to measure the adequacy of the sample. The $KMO = .76$ represented that the sample was of high adequacy. The resulting model was able to explain 62.6% of the variance of *purchase intention*, and $\alpha = .77$. **Table 4.2.1.1** displays the factor loadings of *purchase intention*. In addition, the scale has good reliability, Cronbach's $\alpha = 0.77$. Although this reliability is acceptable, it is not a preferable value.

Table 4.2.1.1 Factor loadings explained the variance and reliability of purchase intention

	Purchase intention
I would consider buying that recommended stuff	.89
It is likely that I will buy that recommended stuff	.89
I will consider purchasing that stuff next time	.88
I have no intention to buy (Reversed)	.40
R^2	.63
Cronbach's α	.77
Eigenvalue	2.50

After deleting one item about "I have no intention to buy", the reliability increased to $\alpha = .87$, which shows more reliability than before, and it is a preferable value for this study. A principal component analysis indicates that the 3 items together form a one dimensional scale, with an eigenvalue above 1 (eigenvalue of 2.40), $KMO = .74$, $\chi^2 (N=311, 3) = 228.40$, $p < .001$, and the resulting model was able to explain 80.2% of the variance of *purchase intention*. **Table 4.2.1.2** shows the specific result. Therefore, purchase intention only kept three items in the following research.

Table 4.2.1.2 Factor loadings explained the variance and reliability of purchase intention

⁵ A K-pop idol group not only has human members but also has virtual members.

⁶ A Chinese virtual idol group.

	Purchase intention
I would consider buying that recommended stuff	.90
It is likely that I will buy that recommended stuff	.90
I will consider purchasing that stuff next time	.89
<i>R</i> ²	.80
<i>Cronbach's α</i>	.87
<i>Eigenvalue</i>	2.40

4.2.2 Source Credibility

The 12 Likert-scale-based items were subjected to a confirmative factor analysis using principal components extraction with a fixed number of factors, with all eigenvalues above 1 (one component's eigenvalue is 6.82), KMO = .89, $\chi^2 (N=311, 66) = 1455.20, p < .001$. The resulting model was able to explain 80.1% of the variance of *source credibility*. The *expertise*, *attractiveness* and *trustworthiness* of *source credibility* performed good reliability, with $\alpha = .92$, $\alpha = .88$ and $\alpha = .93$, respectively. **Table 4.2.2.1** displays the factor loadings of *source credibility*.

Table 4.2.2.1. Factor loadings explained the variance and reliability of source credibility

	Expertise	Attractiveness	Trustworthiness
I feel the VI is competent to make assertions about the product	.89		
I consider the VI as an expert on the product	.87		
I consider the virtual influencer as an expert on the product	.86		
I feel virtual influencer knows a lot about the product	.85		
I think the virtual influencer is good looking		.94	
I consider the virtual influencer very stylish		.81	
I think the virtual influencer is sexy		.80	
I consider the virtual influencer		.71	

very attractive			
I consider the virtual influencer			.93
is trustworthy			
I feel the virtual influencer was			.92
truthful			
I feel the virtual influencer is			.85
honest			
I consider the virtual influencer			.80
is earnest			
<i>R</i> ²	.57	.14	.09
<i>Cronbach's</i> α	.92	.88	.93
<i>Eigenvalue</i>	6.82	1.71	1.07

4.2.3 Parasocial Interaction (PSI)

The principal component analysis explains that the 7 items together form one dimensional scale, with an eigenvalue above 1 (eigenvalue of 4.97), $KMO = .91$, $\chi^2 (N=311, 21) = 808.85$, $p < .001$. The resulting model was able to explain 71.0% of the variance of *parasocial interaction*. The scale has high reliability, Cronbach's alpha = .93. **Table 4.2.3.1** displays the factor loadings of *parasocial interaction*.

Table 4.2.3.1 Factor loadings explained the variance and reliability of parasocial interaction

	PSI
VI made me comfortable as I	.90
am with a friend	
I see VI as a natural, down-to-	.85
earth person	
I can relate to the VI	.85
I feel as if I have known the VI	.84
for a long time	
If there were a story about the	.82
VI in the social media or	
magazine, I would read it	
If VI is a real-person, I would	.81
like to meet him/her in person	
I think I can understand what	.81
kind of person he/she is	
<i>R</i> ²	.71
<i>Cronbach's</i> α	.93

<i>Eigenvalue</i>	4.97
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4.3 Hypothesis Testing

4.3.1 Source Credibility and Purchase Intention

To test H1, a multiple linear regression was conducted with *purchase intention* as a criterium. Predictors were three dimensions of *source credibility – trustworthiness, attractiveness* and *expertise*. The overall model was found to be significant, $F(3, 143) = 42.89, p < .001, R^2 = .47$. However, only *trustworthiness* ($\beta = .24, p = .006$) and *attractiveness* ($\beta = .42, p < .001$) show significant while *expertise* was not significant ($\beta = .14, p = .091$). It means that consumers perceive either the *trustworthiness* or *attractiveness* of virtual influencers and their *purchase intention* will be positively affected.

Table 4.3.1.1 Regression model for predicting the purchase intention (N = 150)

	b*
Constant	1.221
Trustworthiness	.27*
Attractiveness	.41***
Expertise	.13
R ²	.47
F	42.89***

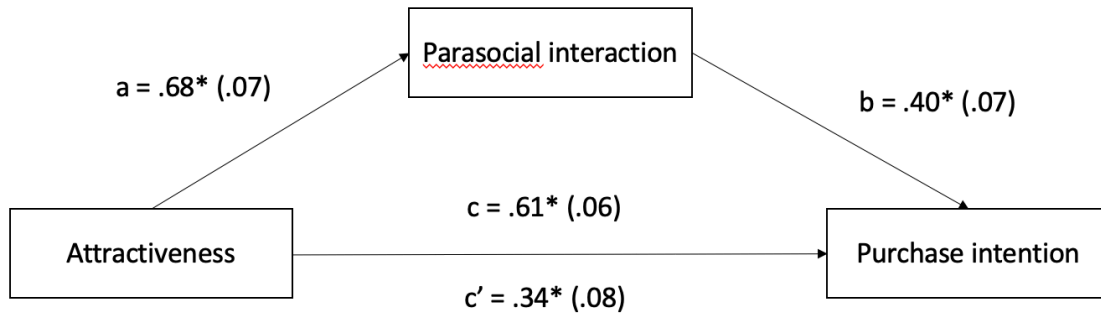
Note. Significance levels: * $p < .05$ ** $p < .01$ *** $p < .001$

4.3.2 Parasocial Interaction as a mediator

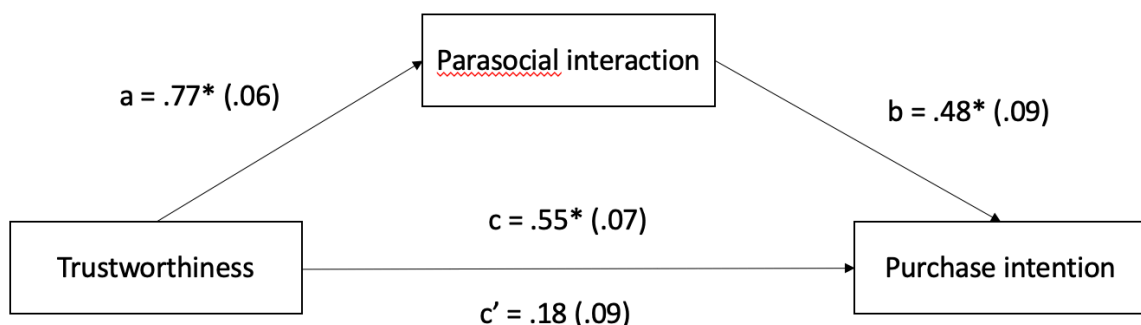
In this research, H2 proposed that parasocial interaction mediates the relationship between source credibility and purchase intention. Since the H1b was rejected that *expertise* has an influence on purchase intention, this research would focus on the *attractiveness* and *trustworthiness* of source credibility. In order to test the mediation effect of parasocial interaction between source credibility and purchase intention, three regression analyses were conducted.

In terms of attractiveness in source credibility, the results showed that the direct effect of the attractiveness of virtual influencers positively predicts the purchase intention ($F(1, 148) = 91.95, c = .61, p < .001$). Analysing the indirect effect, the result explained that there is a significant relationship between attractiveness and parasocial interaction ($F(1, 148) = 107.04, a = .68, p < .001$), and between parasocial interaction and purchase intention ($F(1, 148) = 105.39, b = .40, p < .001$). The total effect of the attractiveness of virtual influencers on purchase intention through parasocial interaction ($F(2, 147) = 69.41, c' = .34, p < .001$) was positive and significant. To increase the credibility of the result, the Sobel test was performed here, with Sobel's $Z = 4.81 (p < .001)$. It

also showed that $a \cdot b = 0.28$ is the estimate of the indirect effect between attractiveness and purchase intention through parasocial interaction. Therefore, it confirmed that parasocial interaction partially mediated the effect of attractiveness of virtual influencer on purchase intention.



In terms of trustworthiness, the regression of purchase intention on trustworthiness was significant, $F(1, 148) = 68.84, p < .001$. This result showed that trustworthiness was a significant predictor of purchase intention, $\beta = .56$, indicating that the first criterion for mediation was satisfied. Second, the regression with trustworthiness predicting parasocial interaction was conducted. The result showed a significant, $F(1, 148) = 189.87, p < .001$, which means trustworthiness was a significant predictor of parasocial interaction. Next, the regression with trustworthiness and parasocial interaction predicting purchase intention was conducted. It showed that trustworthiness ($p > .05$) was no longer significant when controlled by parasocial interaction, which also means that controlling for PSI removes all of the effects of trustworthiness. Again, to increase the credibility of the result, the Sobel test was performed here, with Sobel's $Z = 5.02$ ($p > .05$). Hence, it can be concluded that the relationship between trustworthiness and purchase intention is fully mediated by parasocial interaction.



4.4 Result Summary

This study provides insights into the role that parasocial interaction plays in the relationship between source credibility and purchase intention through using survey and mediation analysis. The result revealed that the sense of parasocial interaction of virtual influencers connected the source credibility with the purchase intention. Virtual influencers' expertise does not have a salient effect on consumers' purchase intention, while trustworthiness and attractiveness significantly affect purchase intention. In addition, parasocial interaction has partially mediated the relationship between attractiveness and purchase intention, and fully mediated the relationship between trustworthiness and purchase intention. These outcomes offer evidence of mediation and clarify that parasocial interaction plays a role in creating ties between virtual influencers and brands.

Table 4.4.1 An overview of the hypothesis testing results

Hypothesis		Outcome
H1 a	Trustworthiness	Accpeted
H1 b	Expertise	Accpeted
H1 c	Attractiveness	Rejected
H2a	Trustworthiness	Accpeted
H2c	Attractiveness	Partially accepted

5. Conclusion and Discussion

In today's changing marketing, marketers are constantly thinking about how to quickly capture the attention of consumers and seize the most cutting-edge marketing methods, with one of the goals being to increase consumers' purchase intention. The development of digital technology has led to the emergence of the metaverse and the subsequent arrival of the virtual influencer era. An increasing number of virtual influencers are emerging in the public, serving as endorsers or promoters of various brands across a range of media, from movies to reality shows. For instance, on November 11th of 2022, during China's largest online shopping festival, numerous brands utilized virtual influencers as a means of demonstrating their entry into the metaverse, with the aim of capturing the attention of potential consumers (Yu, 2022). As mentioned in the previous section 2, some arguments stated that the influence qualities of virtual influencers could be equivalent to those of real human influencers (Miao, 2021; Inpander, 2021).

Previous researches have studied the effect of source credibility of human influencers on consumers' purchase behaviour (Ohanian, 1990; van der Waladt, 2011; Gunawan & Huarng, 2015; Munnukka et al., 2016; Yuan et al., 2016; Lou & Yuan, 2019). According to the features of social media influencers, three important factors of source credibility -- trustworthiness, expertise and

attractiveness were chosen in this study to test the relationship between purchase intention. With the development of social media, consumers constantly interact with influencers and may create imaginary relationships with influencers, which can be explained by parasocial interaction. Previous studies stated that parasocial interaction between followers and influencers is directly influenced by source credibility, and will increase consumers' purchase intention (Yuan et al., 2020; Gong & Li, 2017; Chung & Cho, 2017; Gong, 2020; Lee & Lee, 2022). However, there is limited research on the effect of how virtual influencers' source credibility affects consumers' purchase intention and what is the role of parasocial interaction in this relationship. Therefore, this study aimed to provide more insights into the virtual influencers based on source credibility and purchase intention. In particular, this study addresses a gap in existing research by examining the mediating effects of parasocial interaction, thereby contributing further insights to the field.

5.1 Discussion

Only two factors of source credibility – trustworthiness (H1a) and attractiveness (H1c) were fully confirmed that they positively affect consumers' purchase intention. Therefore, the findings of virtual influencers in this study still supported previous research about the relationship between trustworthiness and purchase intention such as Yuan & Lou (2020) and Wang & Scheinbaum (2018). This finding is consistent with the research conducted by Weismueller et al. (2020) and Torres et al. (2019), which explored the relationship between influencers' attractiveness and consumers' purchase intention. It also further confirmed that virtual influencers emulate similar emotions to human influencers, and can be alternatives to human influencers (Mirowska & Arsenyan, 2023; Appel et al., 2020). On the other hand, H1b also proposed that when consumers perceive the expertise of virtual influencers, their purchase intention will be positively affected. However, the analysis result showed no significant relationship between the perception of expertise and the intention to purchase. The concept of expertise typically pertains to possessing professional knowledge and extensive experience in a particular field (Gass & Seiter, 2011). In contrast, virtual influencers, who are regarded as "authentically fake" influencers, lack this level of credibility. H2 proposed that parasocial interaction would mediate the effect of perceiving the source credibility of virtual influencers on purchase intention. The findings showed that H2 was supported, and it was in line with previous research (Penttinen et al., 2022; Yuan & Lou, 2020; Lou & Kim, 2019; Gong & Li, 2017). Besides, this is further confirmed one argument by Ashraf et al. (2023), people are likely to establish parasocial interaction with influencers whom they think attractive and trustworthy. Furthermore, parasocial interaction between consumers and influencers does result in purchase intention.

It is interesting that when many respondents filled in their familiar virtual influencers in China,

they also put some virtual idols in the survey, such as Hatsune Miku (a Japanese virtual idol), A-soul (a Chinese virtual idol group) and Aespa (a Korean idol group, which has both physical and virtual members). One possible explanation could be the widespread popularity of e-commerce in China, which may imbue these virtual entities with distinct commercial characteristics. If a brand or influencer intends to promote a product, their post will feature a hyperlink that leads directly to the corresponding purchasing page. Most social media platforms in China can establish a connection with an e-commerce platform, and some even have their own integrated e-commerce platform. Chinese social media platforms exhibit multifunctionality, with several popular e-commerce platforms being closely integrated with social networks. These platforms offer innovative services such as livestreaming commerce (Achim, 2021). Thus, these distinctive attributes enable a greater integration of digital media content with digital commerce. Virtual influencers and idols share a comparable definition as they possess equivalent commercial worth and can promote products or endorse brands.

5.2 Theoretical Contribution

This study adds to our understanding of current influencer marketing research streams, particularly from the perspective of virtual influencers. Knowing why and how virtual influencers can pique customers' interests is becoming more and more important as brands continue to favor them. Although there is little study on virtual influencers, many recent studies provide a theoretical explanation for how perceptions of real influencers' source credibility influence purchase intentions and how parasocial interaction mediates this effect. Therefore, by examining the combined impacts of perceived source credibility of the virtual influencers and parasocial interaction on purchase intention in the context of social media, this study makes a contribution to the field. It is one of the earliest research on the subject, with a good data set (150 valid responses) gathered from people who are familiar with and have interacted with virtual influencers at least once. These persons are either natives of China or are presently residing there. This study makes the case that parasocial interaction can fully account for the beneficial effects produced by trustworthiness and purchasing intention. Additionally, mediation analysis demonstrates that parasocial interaction contributes to the explanation of the association between attractiveness and purchase intention.

5.3 Practical Implications

In China, influencer marketing is still booming, and online social media platforms have taken on significant marketing roles. Even though a lot of firms have started working with virtual influencers, the idea is still extremely new. Numerous firms will also claim that working with virtual influencers is a completely novel idea, implying that they are moving forward in the metaverse and reinventing their brands to appeal to younger consumers. Because virtual influences are a relatively

new idea, the findings of this study may help marketers choose or develop their own virtual influencers. This study sheds light on the methods used by virtual influencers to persuade consumers to make purchases. In the meanwhile, this study further supported the idea that virtual influencers might, in some cases, replace real-human influencers. This means that marketers can use virtual influencers to promote goods and services just as they would with real-human influencers. Brands now have a new method for brand promotion thanks to the rise of virtual influencers. Aside from the fact that virtual influencers can transcend physical boundaries, marketers can better manage them when creating their own communication storylines. The reason is that in contrast to real-life influencers, these virtual influencers lack true feeling or opinion. In essence, this is a great way for firms to spread their marketing messaging to customers. Because of this, virtual influencers have a greater capacity to spread a variety of content than actual influencers. In addition, this study indicates that consumers will find information about the products or services from their trusted influencers more compelling than if they search independently (Sokolova & Kefi, 2020). As a result, brands can also identify their target market among the followers of these virtual influencers.

Brands have the option of choosing virtual influencers who will encourage more parasocial interaction. The perception of source credibility and parasocial interaction of virtual influencers is positively correlated with purchase intention, suggesting that more interactive activities like responding to followers and regularly posting daily life will enhance the credibility of virtual influencers, increasing the likelihood that customers will buy the promoted goods or services. The effect of the physical attractiveness of virtual influencers on purchase intention is partially mediated by parasocial contact, demonstrating that attractiveness can both directly and indirectly affect consumers' buying intentions through engaging. One of the things that draws customers and encourages them to make purchases is the virtual influencer's flawless face and figure. Virtual influencers are also believed to be extremely anthropomorphic, which might draw customers' attention to commercials and change their attitudes. This study also discovered that there is no statistically significant relationship between purchase intention and perceived expertise of virtual influencers. Again, since the virtual influencer is not a real person, they cannot claim to be an expert on the subject of a good or service. Although they appear to be real, those who follow virtual influencers are well aware that they are not. This feature has the drawback of preventing virtual influencers from having extensive experience in a given field. Therefore, marketers should refrain from suggesting that virtual influencers are experts in a certain field because doing so would not affect customers' purchase intentions and would perhaps make them uncomfortable. For instance, virtual influencers lack the professional skills and ability to convey the impacts and effectiveness of beauty products, which can only be confirmed in the actual world. Another takeaway from this

research is the importance of measuring source credibility and parasocial interaction when marketers seek to work with virtual influencers. Virtual influencers have the power to breathe fresh life into a brand, increase buy intent, and more. On the other hand, harnessing virtual influencers to emphasize brand value is one of the key goals of the partnership between the company and them. It highlights the brand's ongoing marketing innovation and closes the gap with millennial consumers.

This study is also meaningful for companies which operate virtual influencers. By selecting appropriate marketing strategies, the operations team can help virtual influencers to cultivate a positive relationship with followers and increase their influence. Besides, the operation team needs to constantly enrich the virtual people's life experience. Virtual influencers, being non-human entities, require compelling backstories to maintain their followership. It is suggested that in addition to sharing images on social media, providing contextual narratives about the images can enhance the authenticity of the virtual persona. Simultaneously, the operations team is required to facilitate the establishment of a connection between virtual influencers and their followers, thereby fostering a sense of parasocial interaction between them. This necessitates the enhancement of parasocial interactivity of the virtual influencers by the operations team. However, the operation team also needs to balance the sense of "real" and "unreal". If the virtual influencer only pursues 100% reality, it will lose its "virtual" meaning. The phenomenon of the Uncanny Valley is observed when individuals encounter virtual entities that exhibit characteristics that are situated between the real and unreal. Consequently, to some extent, individuals may experience a sense of discomfort when they encounter virtual influencers that possess an exceedingly realistic appearance.

5.4 Limitation and Reflection

This study also has some limitations. Regarding the age, it could be said that the group under the age of 18 should not be disregarded. Because younger audiences are the target group from nowadays brands, and it seems that they are more easily to accept new things in the world. Second, the study relies on self-reported data from a survey, which cannot clarify whether there is an external factor to affect the result at that time. This may impact the research results, so next time the mixed research method can be used here.

Studies on virtual influencers or the connection between virtual influencers and purchase intention are rare, and the majority of earlier researchers focused on how human influencers affect purchase intention, for example, the theories of source credibility and parasocial interaction used in this study (Ashraf et al., 2023; Lee & Lee, 2022; Aw & Labrecque, 2020; Sokolova & Kefi, 2020; Gong & Li, 2017; Rahmi et al., 2017), and only few studies focused on how virtual influencers affect

consumers' purchase intention (Chiu & Ho, 2023; Huang et al., 2022; Seymour et al., n.d.). Therefore, this study's researcher had to propose the hypotheses by deriving the findings of human influencers and assuming the perceiving source credibility of virtual influencers could affect purchase intention, and parasocial interaction mediated this effect. However, this study only considered the general impact of how virtual influencers affect purchase intention without limiting the specific industry, brand or product. Respondents may think differently when they completed this survey. If this study limited a specific product that virtual influencers promote, the results may be different. Thus, this also could be considered to do a deeper research in the future.

5.5 Future Research

The popularity of virtual influencers brings new changes to traditional influencer marketing. These changes have encouraged researchers to reconsider the reason behind the popularity, and brands can also improve methods to capture consumers' eyes better. Given the virtual marketing trend, it is believed that virtual influencers deserve more attention for future research. Thus, several directions for future research are proposed based on the results of this research.

First, future research may consider the role of product-endorser fit on purchase intention. Finding the right balance between product selling and product fitting is important for brands when selecting influencers to promote their products (McMullan et al., 2021). Zhong (2022) also suggested that advised marketers to look for a promoter with a strong brand match. One might not be persuaded that a virtual influencer promotes lipsticks, for instance. Although they appear to be actual humans, their skin can't match a real person's exactly. As a result, the realism of lip color is greatly diminished. Therefore, it will be fascinating to see how product-endorser fit is taken into account in future studies when examining the impact on purchase intention.

Second, future studies could also research how different types of virtual influencers affect purchase intention. As mentioned in Section 2, it is hard to agree on a fixed definition of virtual influencers because they have many different types. For instance, in terms of image, it could be animation-like and human-like. Alternatively, it also could be that virtual influencers are derived from real people like Aespa or virtual influences derived from novels. Furthermore, the types could also consider the language of virtual influencers, for example, English-speaking or Chinese speaking. Even research can study if there is a difference between virtual influencers who are controlled by AI or by a human operation team.

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