



Research article

What drives Taobao live streaming commerce? The role of parasocial relationships, congruence and source credibility in Chinese consumers' purchase intentions



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ABSTRACT

The year 2021 is one of the most significant years for live streaming commerce, since numerous sectors and businesses have begun to sell their items in the form of live broadcast influence. Especially in China, Taobao live streaming often promotes an event by inviting internet celebrities to cooperate with brands to broadcast the products. For many brands, that is a very successful technique for increasing conversion rates. Researchers have lately grown interested in investigating the factors influencing the purchase decisions of Chinese consumers in the context of Taobao live streaming commerce with online celebrities. The present study is the first to theoretically combine three primarily literature-based disciplines, including source credibility, match-up hypothesis, and parasocial relationship theory, into a unified framework to bridge the research gaps. In this study, the quantitative method was employed through the use of partial least square structural equation modeling (PLS-SEM). The SmartPLS 3.0 software was applied to examine the proposed model. The data were obtained from 454 Chinese consumers who have ever purchased a cosmetic product from a famous internet celebrity on Taobao live streaming. The results indicated that the positive impact of a celebrity endorsers' perceived expertise was the powerful antecedent that affected purchase intentions, while celebrity endorsers' perceived attractiveness and trustworthiness had no significant effect. A good match-up between celebrity and product can improve the celebrity endorsers' perceived attractiveness, trustworthiness, and expertise. Moreover, it was found that the celebrity endorsers' perceived expertise acted as a mediator of the relationship between celebrity-product congruence and purchase intentions. Finally, the findings showed that parasocial relationships have vital mediating effects on increasing purchase intentions.

1. Introduction

Due to being forced to stay at home under the impact of the coronavirus pandemic, consumers have started to consider buying more things to make themselves happy. For example, they buy flowers or quality cosmetics from e-commerce platforms (Gao et al., 2018). They dare not go to shopping malls to buy consumer goods, but their demands continue to increase rather than decrease. Staying at home allows them to spend more time online and gives them time to reflect on their lives. However, viewing online products alone does not motivate consumers to place an order right away, because they lack the skills to discern between products (Wang et al., 2012). The emergence of internet celebrities has come to solve this problem, because they can describe the product's details very well (Lv, 2020). As a result, a number of media and internet

celebrities have emerged one after another. In this special period, the most dazzling scenery of internet celebrities has become a well-known new marketing model (Gao et al., 2018) and has exploded in popularity as a marketing tactic (Dwidienawati et al., 2020). Social networking users feel familiar with internet celebrities and think that they are accessible in online communities. Thus, influential internet celebrities serve as powerful opinion leaders while representing virtual communities (Hwang and Zhang, 2018; Dwidienawati et al., 2020). Internet celebrities take only 2 minutes to review products, but these critical 2 minutes can provide consumers with product information and encourage them to place orders immediately, which can benefit enterprises (Lv, 2020).

The Chinese internet celebrity sector is constantly growing, including e-commerce and promotion. In China, the internet celebrity phenomenon

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began in 1999 and has exploded in popularity since 2015. The Chinese internet celebrity economy's market potential is dramatically expanding; some internet celebrities earn more than USD 40 million each year (Xiao and Zhang, 2016). Particularly, consumers in China tend to accept celebrities as brand ambassadors, and their purchase intentions are influenced by the celebrities they worship. Around 40% of youth products in China use celebrity endorsements as key strategies to boost their marketing influence (Rinka and Pratt, 2018). Internet celebrities' massive online impact, which can be leveraged as an effective marketing tool, has attracted the attention of marketers (Xiao and Zhang, 2016). Furthermore, internet celebrities have become compelling and cost-effective because their solid social relationships with their fans have elevated the fans' need to purchase what they use through social networking sites. As social networking sites grow in popularity, both consumers and businesses are paying more attention to social commerce (Liang et al., 2011). Social commerce is an e-commerce subcategory that utilizes social media to ease social interactions and online transactions, as well as to elevate online purchasing experiences (Wongkitrungrueng and Assarut, 2018). According to Huang and Benyoucef (2013), social commerce is comprised of two categories, namely (1) e-commerce websites that apply social elements to aid social interactions (e.g., Amazon's customer reviews), and (2) social network sites that include commercial features to enhance advertising and/or selling of products/services (e.g., Facebook, Taobao). The function of social commerce that supports interactions among people helps to facilitate online shopping (Cai et al., 2018). In addition, the information that consumers receive from online interactions can benefit consumers in acquiring goods (Kim and Park, 2013). Social commerce is a brand-new platform for shopping online, allowing users to exchange information about their choice of products and where to purchase them (Jascanu et al., 2007). Businesses can also benefit from social commerce because it allows them to build stronger ties with their customers, which contributes to more sales (Hajli, 2014). In this paper, the focus is on a new feature called "live streaming," which can be used to facilitate the selling of products. Live streaming commerce has the attributes of social commerce, combining real-time social interactions with e-commerce. Live streaming is basically a form of synchronous social media that contains some distinctive features such as simultaneity and dependability (Shadkam and O'Hara, 2013). The unique features of live streaming involve video content, real-time communication, and consumption which can be considered a hybrid platform (Fangfang et al., 2019). The key distinction between live streaming commerce and TV shopping is that audiences can connect with celebrities online in real-time, while live streaming comments are active. As an upgrade of traditional e-commerce, video e-commerce shows static images and text on webpages in the form of short videos, whereas live streaming commerce is watched when celebrities are online (Yu, 2020).

Nowadays, over 10,000 internet celebrities promote various products through Taobao live streaming, such as cosmetic products, clothing, and food (Cai and Whon, 2019). Sales from Taobao live streaming reached \$3 billion daily, and within an hour, this figure had eclipsed that of the previous year, and this is just the beginning. Between 2019 and 2021, Alibaba expects its live streaming to generate at least \$65 billion in gross merchandise value (GMV) (Bu et al., 2019). The cosmetic industry seems to be the most booming sector in terms of its sales. It has been driving 16% of category sales; it belongs to the top five industries of consumer goods in China and has developed from being nonexistent to becoming the second-largest market globally in thirty years. Chinese cosmetic markets are expected to grow rapidly in the next five years due to the growing demand for premium cosmetics and the increasing number of working women who spend more on cosmetic products. China's cosmetics sector is one of the world's largest in terms of sales and consumption. The United States is the largest of all, while China is the second-largest. In addition, the cosmetics market is facing increasing demand due to growing urbanization (Mihajlovic et al., 2017). For instance, Estee Lauder's Singles Day live streaming that began in October with the appearance of beauty assistants ended in a marathon 20-hours

streaming session. The brand also carried out live streaming with big hit stars like Li Jiaqi. These initiatives helped Estee Lauder become a successful beauty pre-sale performer, attracting over 400 million views and over \$27 million in sales (Bu et al., 2019). Li Jiaqi, the top internet celebrity in China who is known as the top brother of lipstick, is neither a movie star nor a boy band member. He is well-known for his unrivaled live-stream sales records of cosmetics, particularly lipsticks. He generated hundreds of millions of dollars in sales, with a high purchase conversion rate due to his attractiveness, eloquence, trustworthiness, and product knowledge (Lv, 2020).

However, choosing the right celebrity for the brand is a difficult task. It is critical for companies to choose an effective celebrity (Gupta et al., 2017), as celebrity-product congruence can improve celebrity endorsers' perceived attractiveness, trustworthiness, and expertise (Yoo and Jin, 2015). If customers or followers notice a misalignment between the internet celebrity and the endorsed product, they are more inclined to think of the celebrity as a marketer with ulterior motivations. Once the internet celebrity is seen as a marketer rather than an opinion leader, consumers may have a bad impression of the celebrity, which can influence their purchase decisions (Park and Lin, 2020). Therefore, celebrity-product congruence is an intriguing topic to explore, especially in the context of live streaming commerce where limited research exists.

The match-up hypothesis (Kamin, 1990) and the source credibility model (Ohanian's, 1990) have been used to describe the underlying mechanisms or situations under which celebrities with different traits have any influence on celebrity endorsement. There is no unanimity on how to match which product attributes with internet celebrity qualities. Previous research on the match-up hypothesis has examined celebrity qualities in various dimensions, including sex, skin tone, and physical appeal (Hsu and McDonald, 2002; Huston et al., 2003; Kamins, 1990). The majority of previous studies have looked at the congruence between products and celebrities by focusing on physical attractiveness. For example, Kahle and Homer (1985) and Kamins (1990) stated that celebrities with high physical attractiveness are more influential when they endorse appearance-enhancing products. On the other hand, Till and Busler (1998, 2000) indicated that celebrity endorsers' perceived expertise is a better factor than perceived attractiveness for matching endorsers with products. They claimed that physical attractiveness is not a powerful factor, since the association between an attractive endorser and an appearance-enhancing item seems to be unapparent (Till and Busler, 2000). Thus, companies should think carefully before choosing a celebrity to represent their product. In the setting of live streaming commerce, it was found that celebrity-product match-ups affect the celebrity endorsers' perceived trustworthiness more than perceived attractiveness (Park and Lin, 2020) and there is a lack of linkage between celebrity-product and the perceived celebrity expertise.

Moreover, Jaffari & Hunjra (2017), who studied the mediating role of celebrity effective endorsement in the effect of celebrity-product congruence on purchase intentions in the Pakistan scenario, found the significant influence of celebrity-product congruence on celebrity effective endorsement and consumer purchase intentions. Their findings provided an overview of celebrity effective endorsement but did not describe how different celebrity characteristics (e.g., attractiveness, trustworthiness, expertise) and celebrity-product congruence had positive or negative effects on purchase intentions. Furthermore, the concept of parasocial relationships can be used to explain a close relationship between consumers and celebrities formed through social media (Horton and Wohl, 1956; Perse and Rubin, 1989). This one-sided relationship has evolved into a more engaged and reciprocal one owing to social media. The distance between consumers and celebrities has narrowed down and the roles of followers have shifted from passive viewers, or admirers, to "friends" of celebrities due to new media environments (Chung and Cho, 2017). Although the nature of consumer-celebrity interactions on social media has evolved, very few studies have been done to analyze the implications of celebrity endorsements, especially in live streaming commerce. Current insights are also limited. Previous research on celebrity

endorsements has revealed a significant discrepancy in terms of what kinds of celebrity characteristics are most likely to establish strong parasocial relationships and purchase intentions in the context of live streaming commerce. There is also a dearth of understanding of how certain internet celebrity characteristics (such as attractiveness, trustworthiness, and expertise) influence the effectiveness of parasocial relationships and purchase intentions.

However, from the literature review, it was found that the match-up hypothesis and the parasocial relationship theory are not directly related, but the match-up hypothesis could explain the relationship between the celebrity-product congruence and the source credibility model, including celebrity endorsers' perceived attractiveness, trustworthiness, and expertise. Besides, the parasocial relationship theory was found to be associated with the source credibility model, which is considered an essential factor for persuading consumers to establish parasocial relationships (Rubin and Perse, 1987; Kim et al., 2015). Based on the above information, this study aims to extend the current body of knowledge by using the source credibility model as a mediator to connect the match-up hypothesis and parasocial theory. In the past, no research has been done to investigate the relationship between these three theories. Thus, in this study, the research questions were formed to find out whether the source credibility model could mediate the relationship between the match-up hypothesis and the parasocial relationship theory in purchase intention studies. Then those research questions were used to create a conceptual framework for studying consumers' purchase intentions in the context of live streaming commerce. Therefore, the research framework in this study was proposed based on the match-up hypothesis, source credibility model, and parasocial relationship theory. The objectives of this study are (1) to explore what kinds of celebrity characteristics (attractiveness, trustworthiness, and expertise) are most likely to generate strong purchase intentions, (2) to investigate the underlying mechanisms through which celebrity characteristics influence purchase intentions by focusing on the mediating role of parasocial relationships, (3) to study the influence of celebrity-product congruence on celebrity characteristics, and (4) to empirically analyze whether the relationship between celebrity-product congruence and purchase intentions is mediated by celebrity characteristics. Regarding the contribution of this study, the findings of this study provide useful information both in terms of theoretical and practical implications. For the theoretical implications, this study discovered new theoretical knowledge about a positive relationship between celebrity-product congruence and purchase intentions that is serially mediated by celebrity characteristics and parasocial relationships. This leads to the conclusion that the three theories are serially related in the context of live streaming commerce through two mediating factors, which are celebrity characteristics and parasocial relationships. Considering the practical implications, marketers will understand the key process in planning successful internet celebrity strategies for generating sales through live streaming channels, which consists of three steps: 1) selecting or recruiting internet celebrities whose image is consistent with the product's characteristics, 2) developing internet celebrities to be experts in their endorsed products, and 3) building strong consumer-celebrity parasocial relationships in the long run.

The present study was carried out according to the literature review, hypothesis establishment, and research framework. The theoretical model was empirically tested with data from a printed survey of Chinese consumers who are studying higher education in Thailand. In this study, all hypotheses were tested, using structural equation modeling (SEM). The research results, discussion, and significant implications are respectively presented in the following section.

2. Literature

2.1. Celebrity endorsement and internet celebrities

Celebrity endorsements are defined as successful people who are seen by the public for their professionalism and expertise and can deliver

objective information such as knowledge, skills, experience, and trust to others (Kamins, 1989; Goldsmith et al., 2000). Traditionally, celebrity endorsers can be anyone from the entertainment, fashion, and sport industries, as well as politicians and business people. These days, due to the dramatic growth of reality television shows and multiple social media platforms (e.g., YouTube, Facebook, Twitter), the term "celebrity" has been defined in various different ways. In other words, celebrities also include ordinary people who become famous in reality shows. Through social media spotlights, ordinary people can become recognized. When they are increasingly recognized by the public, they will eventually become famous just like absolute superstars (Yang, 2018). Celebrities may try to give a compliment about a brand's features and benefits and recommend consumers to purchase it. Some celebrities may also try to be informative about the particular product. For example, they may provide valuable opinions professionally or be associated with the product. All those actions are to raise customers' trustworthiness. Celebrity endorsement is a very frequent marketing technique for large corporations as part of their marketing communications plan (Ndlela and Chuchu, 2016). Celebrity endorsement is a crucial tool in corporate marketing and communication strategies (Huang and Copeland, 2020). Companies expect celebrities to be the magnets to their target market in order to sell the products or change consumers' behavior (Ermeç Sertoglu et al., 2014). Consumers tend to purchase more of a product when endorsers can express their satisfaction and admiration for it to the public and create credibility in their relationships with it. Compared to a non-celebrity spokesperson, a celebrity spokesperson has a greater influence on the attitudes and purchase intentions of consumers (McCormick, 2016). Consumers regard celebrities as friends, as though they personally know them (Choi and Rifon, 2007). Moreover, in this modern era, the emergence of social media is widespread, causing a change from traditional celebrities to internet celebrities.

The internet celebrities who have an enormous number of supporters (up to one million followers) are well known and are considered endorsers who can draw large online audiences because of their work and elusive lifestyles (Marques et al., 2021). This study defines internet celebrities as well-known people who have huge followers and are considered endorsers who can draw large online consumers on Taobao live streaming (Marques et al., 2021). Companies use celebrity endorsements to reach out to their target customers. Internet celebrities are active online content creators that serve as opinion leaders for businesses, goods, and potential customers, expressing their viewpoints to a specific audience. They frequently present their tested products to other online users in order to give feedback or promote them. When purchasing products or services, internet users tend to ask for advice from relatives and friends; they are also more likely to seek out items or services recommended or supported by celebrities (Huang and Copeland, 2020). These are the key considerations when deciding which celebrity to employ. Furthermore, considering the high costs and risks of celebrity endorsement strategies, it is critical to carefully select appropriate celebrity spokespeople for specific products. What qualities should be taken into consideration? Are celebrity attractiveness, trustworthiness, and expertise enough to pique consumers' interest in making a purchase? The section that follows examines the various models of source credibility that have been investigated in this article.

2.2. Source credibility and endorsement effectiveness

The source credibility model is associated with an endorser's positive qualities (Ohanian, 1990). It is a commonly used model for evaluating endorsement effectiveness (Lim et al., 2017), which is described as the degree to which the source is seen to have knowledge and communication skills and can be relied upon to deliver an unbiased viewpoint on the topic (Goldsmith et al., 2000). The process through which the viewpoints of a source with respectable reputation (e.g., a celebrity) affect consumers' attitudes and behaviors is called internalization. This process occurs when consumers accept impact from a source on their individual

opinions and belief systems. In other words, a celebrity's perceived trustworthiness may have a significant impact on communication efficacy measures, including advertisement recall rates and purchase inclinations. The source credibility model suggests that an advertising message from a reliable source influences customers' thinking, feelings, and actions (Hoveland et al., 1953). This research is based on Ohanian's (1990) source credibility model's theoretical foundations. According to this model, source credibility is a three-component construct that includes celebrity endorsers' perceived attractiveness, trustworthiness, and expertise, all of which influence the endorser's credibility, and it was discovered that all these determinants had a remarkable impact on customers' purchase intentions.

2.3. Purchase intentions and internet celebrities

Purchase intentions (INT) are consumers' willingness to buy a certain product or service based on their subjective appraisal along with their overall assessment (Dodds et al., 1991). Purchase intentions are a person's intentional decision to make an effort to buy something (Spears and Singh, 2004). Moreover, according to (Rahmi et al., 2017), purchase intentions are a consumer's plans to buy a product at a specific occasion or time, which is considered a key predictor for successful marketing because it precedes an actual purchase activity and acts as a significant predictor of purchase behavior (Shin and Biocca, 2017; Peña-García et al., 2020). According to Ajzen (1991), consumer intentions are an indicator of the degree of people's willingness to perform a certain behavior, which in this research would be determined as online purchase behavior through live streaming commerce. Several previous studies have examined the impact of celebrities on purchase intentions. For example, Atkin and Block (1983) revealed that celebrity endorsers can create higher purchase intentions and more favorable opinions about advertising, compared to non-celebrity endorsers. Goldsmith et al. (2000) also indicated that celebrity endorsements tend to have a favorable impact on consumer purchasing behavior. Similarly, Zaheer (2018) stated that the source credibility retains the potential to affect the purchase intentions. On social networking sites, Djafarova and Rushworth (2017) showed qualitatively that internet celebrities, such as those on Facebook, Instagram or YouTube, have a stronger influence on young consumers' purchasing behavior than traditional celebrities. Moreover, Jin and Phua (2014) discovered that good tweets from celebrities who have enormous followers can increase consumers' purchase intentions. Lim et al. (2017) and Pick (2020) also found that a perceived social media influencer's credibility can be a crucial indicator of purchase intentions. In the realm of live streaming shopping, Park and Lin (2020) confirmed that internet celebrities affect Chinese consumers' purchase intentions.

2.4. Match-up hypothesis

In response to the inconsistent findings of source credibility models, a group of researchers suggested the match-up hypothesis as an alternate explanation to assist in the selection of celebrity endorsers (Erdogan, 1999; Forkan, 1980; Kamins, 1989; Kamin and Gupta, 1994). Apart from source credibility, this group of researchers proposed that the celebrities and the product they are promoting must have a congruent relationship. Once there is an incongruence, the vampire effect in which people remember the celebrity rather than the promoted product is likely to occur (Yang, 2018).

In this particular case, celebrity-product congruence (CPC) is defined as a fit between the characteristics of a famous internet celebrity and product attributes. One critical factor that can provide a prediction about whether or not a celebrity endorsement is going to be successful is celebrity-product congruence (Kahle and Homer, 1985), which will be validated solely when the celebrity and the product show a good fit (Till and Busler, 2000). The term "fit" relates to the resemblance, similarity, relevancy, or consistency between the celebrity and the product. When

there is an excellent fit between the celebrity endorser and the product they endorse, the endorser is perceived to be more effective (Kamins, 1990). The fan's assessment of a celebrity's relevance to a specific item is also a factor in celebrity-product congruence (Misra and Beatty, 1990).

Generally, consumers are more likely to form an associative relationship between two stimuli that are similar (McSweeney and Bierley, 1984). The perceived "congruence" between the product and the celebrity is a crucial antecedent of effective endorsement because of this associative relationship (Yang, 2018). Furthermore, McCracken (1989) stated that a lack of compatibility between brands and celebrities is the fundamental cause for the failure of some celebrity endorsements. Thus, the match-up hypothesis suggests that celebrity-product congruence can make a celebrity endorsement strategy become more compelling and effective. In addition, celebrity-product congruence can also enhance the endorser's credibility (Lee and Koo, 2015).

2.5. Parasocial relationship theory

A parasocial relationship refers to a longer-time relationship formed by a media user with a mediated performer (Dibble et al., 2016). A celebrity-follower relationship is a good example of a parasocial relationship. Social media celebrities allow for reciprocal relationships through interacting with their followers. Therefore, their followers can form long-term socioemotional attachments to them (Bond, 2016; Kurtin et al., 2018). Adolescent consumers typically admire internet celebrities and consider them to be friends (De jans et al., 2018). The parasocial relationship theory, which has its roots in psychology and media studies, explains why consumers trust and follow the advice of some celebrities but not others (Horton and Wohl, 1956). Consumers have been shown to form parasocial relationships with the celebrities they follow on social media, similar to the characters in favorite television series (Lueck, 2015; Chung and Cho, 2017; De jans et al., 2018). Lee and Watkins (2016) stated that forming these relationships with a YouTube vlogger led to a more positive brand perception. These relationships are distinguished by their one-sided nature. Consumers feel as if they personally know the celebrity they have been supporting and following, despite the fact that they have never met in real life. The celebrity, on the contrary, knows absolutely nothing about the follower, resulting in a one-sided relationship. Hence, there is an illusion of intimacy (Lueck, 2015).

Even though consumers have formed parasocial relationships through traditional media such as television, social media offers even better opportunities for this due to its interactive and open nature (Labrecque, 2014). With reference to interactive nature, Lueck (2015) argued that through interactive questions, social media or internet celebrities invite consumers to interact, creating an illusion of friendship even though their participation in the discussion is minimal. Customers connect with the top internet celebrities as if they were physically there and in a reciprocal relationship (Horton and Wohl, 1956; Perse and Rubin, 1989). As a result, parasocial relationships indicate longer-lasting emotions of closeness that viewers experience with media personas beyond brief exposure (Bond, 2018). According to previous research, these relationships are classified as affect-laden intimate pseudo-friendship (Hartmann et al., 2008). Parasocial relationships are mental ties that media consumers develop with media characters or celebrities in a unilateral manner (Rubin and Step, 2000). As a result of the extensive use of social media, parasocial relationships develop, and the increasing reliance on the internet is likely to worsen parasocial relationships (Shin, 2016).

The parasocial relationship theory is one perspective that explains the effectiveness of influencer marketing in social media. Researchers in marketing and consumer behavior have utilized the parasocial relationship theory to explore themes including consumer-brand relationships in social media (Labrecque, 2014), parasocial advertising (Lueck, 2015), the strength of parasocial relationships in social media (Bond, 2016), as well as which social media channels (Colliander and Dahlén, 2011) and what kinds of celebrity characteristics are most likely to generate strong parasocial relationships (Chung and Cho, 2017).

2.6. Research framework and formulation of hypotheses

2.6.1. Celebrity endorsers' perceived attractiveness and purchase intentions

The present study uses *Ohanian's (1990)* source credibility model to untangle celebrities' impacts on purchase intention behavior. This model highlights the three source effects that have the most impact on purchase intentions (*Amos et al., 2008*). It uses three variables to assess the attributes of endorsers' perceived credibility: celebrity endorsers' perceived attractiveness, trustworthiness, and expertise.

Celebrity endorsers' perceived attractiveness (ATT) is defined as a famous internet celebrity's physical attributes or characteristics that may attract the targeted audience through physical appearance and personality properties (*Ohanian, 1990; Mansour and Diab, 2016*). Physical attractiveness has a massive impact on consumer intentions. Moreover, endorsers with attractive features can positively affect consumers' purchasing intentions (*Kahle and Homer, 1985*). Perceived attractive endorsers tend to contribute to purchase intentions (*van der Waltd et al., 2009*). Moreover, the studies of *Tanjung and Hudrasyah (2016)* and *Subbiah and Sathish (2020)* also found that the attractiveness of celebrity endorsements has an impact on purchase intentions. However, *Park & Lin (2020)*, who directly conducted a study in the context of live streaming commerce, indicated that celebrity endorsers' perceived attractiveness has no effect on purchase intentions. Due to these inconsistent findings, the following hypothesis was made to prove the findings of *Park and Lin (2020)* in the context of live streaming commerce:

H1. Celebrity endorsers' perceived attractiveness has a positive influence on purchase intentions.

2.6.2. Celebrity endorsers' perceived trustworthiness and purchase intentions

Celebrity endorsers' perceived trustworthiness (TRU) is defined as the confidence that consumers have regarding the validity of assertions communicated by the endorser, that consumers perceive a famous internet celebrity's honesty, believability, and integrity (*Ohanian, 1990; Mansour and Diab, 2016*). According to the consumer's perspective, *Tripp et al. (1994)* claim that an endorser is more trustworthy when only endorsing one brand. Trustworthiness is essential for practical endorsement because consumers would want to believe the information presented by a trustworthy endorser. The endorsers who gained trust from their fans tend to successfully create positive attitudes toward the endorsed products, automatically increasing customers' purchasing decisions. To put it another way, consumers believe what the celebrity endorser conveys to them in the advertisement and trust them. Moreover, celebrity endorsements with a high trustworthiness score can change consumer attitudes and purchase intentions (*Mat et al., 2019*). This idea is supported by *Chuang and Cho (2017)*, who claim that purchasing decisions and brand credibility are greatly affected by celebrities who are believed to be truthful and trustworthy. Furthermore, *Tanjung & Hudrasyah's (2016)* study confirms that celebrity endorsers' perceived trustworthiness influences purchase intentions. Hence, the following hypothesis was made:

H2. Celebrity endorsers' perceived trustworthiness has a positive influence on purchase intentions.

2.6.3. Celebrity endorsers' perceived expertise and purchase intentions

Celebrity endorsers' perceived expertise (EXP) is defined as a famous internet celebrity's breadth of professionalism, experience, expert, qualification, or skill in relation to the promoted product/brand (*Ohanian, 1990; Ermeç Sertoglu et al., 2014*). Different types of celebrities are thought to have differing levels of product knowledge. Athletes, for example, are thought to have a high level of knowledge about sports products, whereas entertainment stars are thought to have expertise in cosmetics products (*Gong and Li, 2017*). The endorsing celebrity should be an expert on that particular product or brand, because this knowledge would better convince consumers than an endorser who does not have the expertise (*Till and Busler, 1998*). Celebrities with experience are seen

as product masters, allowing them to express to consumers their dependability on their knowledge of the things they promote (*Mat et al., 2019*). Consumer attitudes and purchase intentions can be influenced by celebrity endorsement with high competence (*Liu and Teo, 2007*), and celebrity endorsement with high expertise has a positive impact on both attitudes and purchase intentions (*Till and Busler, 2000*). Consumers regard a celebrity who is seen as an expert as more compelling than others. In addition, a high-expertise endorser is more persuasive and has a positive impact on customer sentiments and purchase intentions (*Goldsmith et al., 2000*). Moreover, *Subbiah & Sathish (2020)* found that the celebrity endorsers' perceived expertise has a favorable influence on purchase intentions. Based on the literature review, it was found that most previous research uses expertise as a variable to study the characteristics of celebrities in the context of traditional mass media advertising and that no research has applied this variable in the context of live streaming commerce. In addition, *Park and Lin (2020)*, who studied the characteristics of Chinese internet celebrities in the context of live streaming commerce, also did not include expertise as a variable in their study. Therefore, the following hypothesis was determined:

H3. Celebrity endorsers' perceived expertise has a positive influence on purchase intentions.

2.6.4. Source credibility and parasocial relationships

A parasocial relationship (PSR) is described as a delusional experience where people interact with media personalities, celebrities, or performers, as if they have reciprocal connections (*Labrecque, 2014*). Various studies have found that source credibility is essential for persuading consumers to form parasocial relationships (*Rubin and Perse, 1987; Kim et al., 2015*). Additionally, *Yuan et al. (2016)* conducted an experiment showed that source credibility directly fostered the formation of parasocial relationships. *Bond (2016)* found that two-sided social media interactions (e.g., the celebrity responding to a comment made by a follower rather than just posting new things) strengthen the parasocial relationship. Moreover, in prior studies, the characteristics of media personas, were often investigated to determine whether they could predict the strength of parasocial relationships (*Bond, 2018*). Research on social media influencer endorsements has shown that source credibility affects parasocial relationships (*Tan, 2020*). These studies suggest that higher source credibility leads to a stronger formation of a parasocial relationship between the follower and the celebrity. According to the literature review, it was found that most of the past research studies the effect of source credibility on parasocial relationships as a whole, without dividing celebrity characteristics into celebrity endorsers' perceived attractiveness, trustworthiness, and expertise. Furthermore, previous research has not investigated the relationship between source credibility and parasocial relationships in the context of live streaming commerce.

Moreover, there are only a few studies on the mediation effects of parasocial relationships. Limited research has shown that source credibility is credited with improving parasocial relationships, leading to an increase in purchase intention. Evidently, there is a positive correlation between parasocial relationships and the source credibility of celebrities as well as purchase intentions. This idea is supported by *Lou and Kim (2019)*, who investigated the mediating role of parasocial relationships in the correlation between source credibility (celebrity endorsers' perceived attractiveness, trustworthiness, expertise) and purchase intentions. Their findings indicate that the correlation between source credibility and purchase intentions is mediated by parasocial relationships. Therefore, celebrity characteristics lead to consumers' purchase intentions, which are promoted by the parasocial relationships between celebrities and consumers. From the literature review, there has been no research to study the role of parasocial relationships as mediators in the context of live streaming commerce, and merely a few studies have been done to investigate the mediation effects of parasocial relationships. Thus, the following hypotheses were established:

H4a. Celebrity endorsers' perceived attractiveness has a positive influence on parasocial relationships.

H4b. Parasocial relationships mediate the relationship between celebrity endorsers' perceived attractiveness and purchase intentions.

H5a. Celebrity endorsers' perceived trustworthiness has a positive influence on parasocial relationships.

H5b. Parasocial relationships mediate the relationship between celebrity endorsers' perceived trustworthiness and purchase intentions.

H6a. Celebrity endorsers' perceived expertise has a positive influence on parasocial relationships.

H6b. Parasocial relationships mediate the relationship between celebrity endorsers' perceived expertise and purchase intentions.

2.6.5. Parasocial relationships and purchase intentions

The notion of parasocial relationships may help to understand the interactions between internet celebrities and their fans, and the former's ability to persuade the latter. A virtual online social interaction exists between internet celebrities and their fans. In other words, followers try to get in touch with celebrities as much as possible through online platforms. They might talk to each other virtually, or the celebrities might answer their fans' questions through social media platforms; accordingly, intimate relationships are established between them (Xiao and Zhang, 2016). As parasocial relationships have continually developed, viewers perceive Youtubers as people who can provide good information about so many different things (Rubin et al., 1985). By displaying their everyday use of endorsed products, presenting all kinds of items, and post-purchase evaluation on social network sites, the modeling of online celebrities becomes successful, boosting their followers' desire to buy (Boon and Lomore, 2001). Also, the findings of Kim et al. (2015), Hwang and Zhang (2018), and Hanief et al. (2019) showed that parasocial relationships with online celebrities positively impact consumer behaviors associated with celebrity endorsement. In addition, Choi and Park (2011) carried out a comparative study with two consumer groups and found that the group with a strong consumer-celebrity parasocial relationship has higher purchase intentions than the group with a weak consumer-celebrity parasocial relationship. However, the literature review showed that parasocial relationships have never been directly studied in the context of live streaming commerce. Thus, the following hypothesis was proposed to confirm whether parasocial relationships can be applied in the context of live streaming commerce: The following hypothesis was proposed:

H7. Parasocial relationships have a positive influence on purchase intentions.

2.6.6. Celebrity-product congruence and source credibility

Kamins and Gupta (1994) found that celebrity-product congruence affects the believability of endorsers. Till (2001), in an analysis of cases of poorly viewed items such as cigarettes, argued that supporting such commodities might cause a celebrity to lose prestige relatively fast. In-depth interviews were used by Ang and Dubelaar (2006) to investigate the effects of automotive commercials on the image of popular performers, and they discovered that marketing for low-cost cars had a negative influence. According to these studies, products with negative connotations can harm a celebrity's image. A celebrity with a similar image to the product can boost credibility (Ermec Sertoglu et al., 2014). Moreover, Lee and Koo (2015) found that the influencer's credibility was significantly affected by the influencer-product fit. Endorsers that advertise products that do not fit their expertise, or a bad product match-up, are perceived to have less credibility. This is in line with Yoo and Jin (2015), who found that when the celebrity-product congruence was low, the perceived attractiveness, trustworthiness, and expertise of the celebrity were dramatically reduced. A good match can also benefit the celebrity endorser because it helps to increase the celebrity endorsers'

perceived attractiveness, trustworthiness, and expertise (Yang, 2018). In the setting of live streaming commerce, it was found that celebrity-product match-ups affect the perceived trustworthiness more than the perceived attractiveness (Park and Lin, 2020), and there is a lack of linkage between celebrity-product congruence and the perceived expertise of celebrities.

For the mediation effects of celebrity characteristics that only a few studies have examined. Previous limited studies found empirical support that congruence between the message and the influencer's style can significantly enhance consumer purchase intentions (Pöyry et al., 2019; Torres et al., 2019). This is consistent with Jaffari and Hunjra (2017), who studied the mediation role of celebrity effective endorsement in the effect of celebrity-product congruence on purchase intention in the Pakistan scenario. Their research results indicated the significant influence of celebrity-product congruence on celebrity effective endorsement and consumer purchase intentions. Their findings also provided an overview of effective celebrity endorsements but did not describe how different celebrity characteristics and celebrity-product congruence had positive or negative effects on purchase intentions. Thus, the following hypotheses were proposed to investigate the mediation role of different celebrity characteristics:

H8a. Celebrity-product congruence has a positive influence on celebrity endorsers' perceived attractiveness.

H8b. Celebrity endorsers' perceived attractiveness mediates the relationship between celebrity-product congruence and purchase intentions.

H9a. Celebrity-product congruence has a positive influence on celebrity endorsers' perceived trustworthiness.

H9b. Celebrity endorsers' perceived trustworthiness mediates the relationship between celebrity-product congruence and purchase intentions.

H10a. Celebrity-product congruence has a positive influence on celebrity endorsers' perceived expertise.

H10b. Celebrity endorsers' perceived expertise mediates the relationship between celebrity-product congruence and purchase intentions.

Based on the literature review and theoretical background, the conceptual framework of this study was developed as shown in Figure 1.

3. Methodology

3.1. Sample characteristics

The population in this study is Chinese consumers who are studying higher education in Thailand. They are between 18 and 30 years of age. They have seen famous Chinese internet celebrities promote and sell cosmetic products, and have even purchased those cosmetic products from the famous Chinese internet celebrities on Taobao live streaming. Chinese university students are selected because they have been identified as the representatives of mainstream live commerce users. Based on recent statistics and news, approximately 70% of live streaming users were under the age of 30, with Chinese university students playing a significant part in the expansion of live streaming commerce (Lin and Lu, 2017; Fangfang et al., 2019). For structural equation modeling, the sample size should be at least 10–20 times the number of items (Hair et al., 2010). The proposed model has one dependent variable involving three items and five independent variables involving twenty-four items. Thus, the sample size range of 270–540 is appropriate.

3.2. Data collection procedure

In this study, questionnaires were used to collect data. The developed questionnaires were distributed to the universities in Bangkok and the Metropolitan area where Chinese students are enrolling in higher education (13,999 students in 97 universities) October, 2021. The reason for

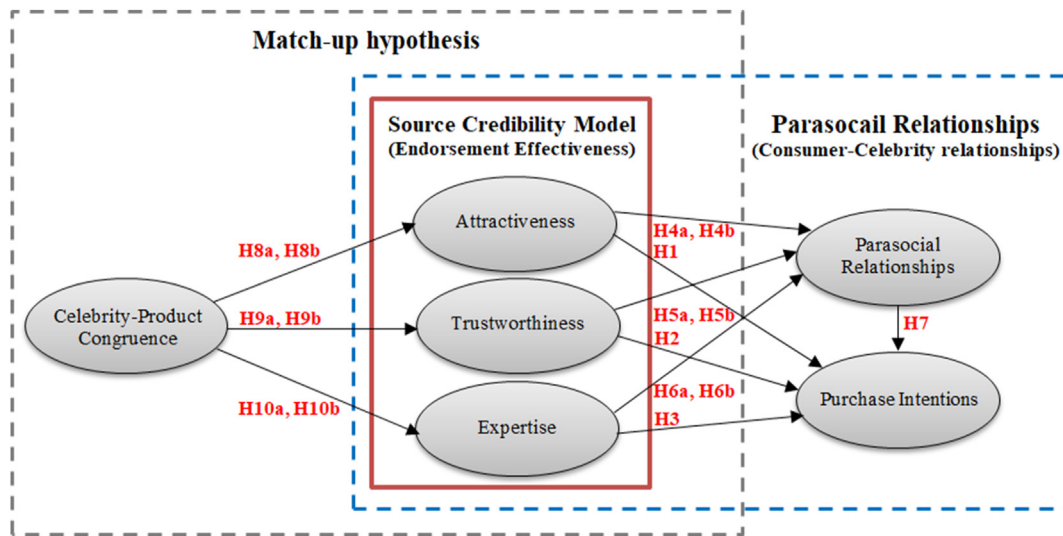


Figure 1. Conceptual framework.

exploring the specific areas of Bangkok and the Metropolitan is that these two regions contain approximately 80% of the Chinese students studying at universities in Thailand (Office of the Higher Education Commission, 2020). This study uses probability sampling, in which the stratified sampling method was used because the population is precise. The first stage is to categorize the universities in Bangkok and the Metropolitan area in Thailand into groups, according to two different regions (Bangkok and Metropolitan). The second stage is to identify the name list of the classified universities organized in the first stage. In the third stage, the universities are selected from half of the total number in stage two by a simple random sampling method; 20 universities were selected from a total of 40. Finally, the sample size of 27 was set to be the same number for all universities randomized in stage three. At the beginning of the survey, three filter questions were asked to ensure the eligibility of participants. The participants were asked to answer the filter questions as follows: (1) Do you know about any famous Chinese internet celebrities? (2) Have you ever seen a famous Chinese internet celebrity promoting and selling cosmetic products on Taobao live streaming? (3) Have you ever purchased a cosmetic product from a famous Chinese internet celebrity via Taobao live streaming? Out of all 644 returned questionnaires, the responses of 162 respondents, who have never seen a famous Chinese internet celebrity promoting and selling cosmetic products and have never purchased a cosmetic product on Taobao live streaming, and 28 respondents, who provided incomplete data, were discarded. As a result, the data of 454 respondents were used for data analysis.

3.3. Instrument development

This research employed the quantitative method and used the data collected by a printed survey (closed-ended questionnaire) to test the research model. The first part of the questionnaire included sample screening questions. The second part gathered personal data. The final part contained the measurement scales developed from relevant past works. Similar to most previous studies, the present study used a five-point Likert scale of agreement ranging from strongly disagree (1) to strongly agree (5) to measure thirty items corresponding to six constructs. Purchase intentions measurements were adapted from Ha and Lam (2017). The scales to measure attractiveness, trustworthiness, and expertise were obtained from the study by Gupta et al. (2017). The scales to measure celebrity-product congruence were adapted from Ha and Lam (2017), and the proposed scale for the parasocial relationship is based on the studies by Claessens and Van den Bulck (2015), Chung and Cho (2017), and Hwang and Zhang, (2018). All the items are presented in Table 3.

4. Data analysis and results

4.1. Descriptive analysis

This study comprised 454 respondents who answered the questionnaire. The majority of the respondents were females (n = 298, 65.64%), followed by males (n = 87, 19.16%), and LGBTQ (n = 69, 15.20%). Most of them were aged between 21 and 23 years old (n = 252, 51%). For the education level, 302 respondents (66.52%) held a bachelor's degree. A total of 360 respondents were single (79.30%) and 229 respondents received 10,000–30,000 baht per month (50.44%). The summary of the demographic characteristics of the respondents is shown in Table 1.

4.2. Data analysis

SEM was deemed the best approach for answering the objectives of this research, as it can analyze overall data fit indices and deal with various dependent and independent variable relationships (Zweig and Webster, 2003). In the present study, the partial least square structural equation modeling (PLS-SEM) (using the SmartPLS3.0) method was

Table 1. Demographic characteristics of respondents. (N = 454).

Variable	Category	Frequency	Percentage
Gender	Male	87	19.16
	Female	298	65.64
	LGBTQ	69	15.20
Age	18–20 years old	58	12.78
	21–23 years old	252	55.51
	24–26 years old	78	17.18
	27–30 years old	66	14.54
Education level	Bachelor's degree	302	66.52
	Master's degree	115	25.33
	Doctoral's degree	37	8.15
Status	Single	360	79.30
	Married	90	19.82
	Divorced	3	0.66
	Widowed	1	0.22
Income	<10,000 baht	45	9.91
	10,000–30,000 baht	229	50.44
	30,001–50,000 baht	71	15.64
	>50,000 baht	109	24.01

applied to assess the measurement and structural model, which was created to allow for the estimation of causal-predictive relations (Wold, 2006; Hair et al., 2011). PLS-SEM is able to provide explanations and predictions, guaranteeing the practical relevance of causal explanations and demonstrating that it is superior to regression analysis in evaluating mediations (Hair et al., 2019). Research has confirmed that PLS-SEM functions exceptionally well with such data (Sarstedt et al., 2016; Rigdon et al., 2017; Pick, 2020). Given the complexity of the created model, the above information explains why PLS-SEM was selected to use in this study.

4.3. Common method variance or common method bias test

This study used Harman's single-factor test (Podsakoff and Organ, 1986) to examine CMV. This test is performed through the use of principal component analysis (PCA) as suggested by Tehseen et al. (2017). According to the unrotated principal axis factoring analysis, a single factor explains 46.527% variance (Table 2), which is less than 50%. The results indicated that all indicators passed that test (Kock, 2020). Moreover, it was found that the R² value is 0.582 (Figure 2), which is below 0.7, and the VIF value is 2.39 (VIF = 1/(1-R Square), which is below 3.3, as recommended by Kock (2015). Thus, there is no indication of common method bias in this study, which means that it is not a major concern that may affect variable relationships.

4.4. Measurement model analysis

A pre-test was carried out to examine the content validity and reliability of the instruments. To confirm the content validity, the IOC (index of item-objective congruence) was assessed by 3 experts. The feedback on the questionnaire's layout and the ambiguity of the questions was received. Some adjustments to the questionnaires were made as deemed necessary. The IOC value must be between 0.50 and 1.00. If the IOC value is less than 0.50, it will be revised in accordance with the suggestion of Rovinelli and Hambleton (1977). Then 30 copies of the revised questionnaires were tried out to test the reliability. The results showed that the Cronbach's Alpha Coefficient ranged from 0.947 to 0.957, which met the criterion of at least 0.9 (Streiner, 2003), and the Corrected Item-Total Correlation ranged from 0.578 to 0.855, which met the threshold value of at least 0.3 (Field, 2005).

After 454 respondents completed the questionnaires, the convergent validity was analyzed using confirmatory factor analysis. The results showed that the standardized factor loading of all items was above 0.6 (Hair et al., 2010), as demonstrated in Figure 2 and Table 3. The Cronbach's Alpha (CA) values were greater than 0.9, which was included in the model ranging from 0.907 to 0.937. All were higher than the suggested threshold of 0.9 (Streiner, 2003), indicating that the scales are highly reliable. The Average Variance Extracted (AVE) result indicated that each component in the model surpassed 0.5, with values ranging from 0.692 to 0.849. All were higher than Fornell and Larcker (1981) that suggested threshold of 0.5. The Construct Reliability (CR) showed that each construct was above 0.9 and ranged from 0.931 to 0.952 in the model, which met the threshold criterion of 0.8 suggested by Nunnally (1978). As a result, the scale's convergent validity is high. Therefore, it

could be concluded that the measurements were reliable and valid. The results are detailed in Table 3.

To ensure discriminant validity, the cross-loading and the square root of the AVE, ASV and MSV were tested. The diagonal in bold of each construct was compared to its corresponding correlation coefficients with other constructs. Each construct's associated correlation coefficient was lower than the square root of the AVE. As it is recommended that the square root of the AVE must be greater than the number in each row and column, the results indicated that the construct's correlation is higher than the correlation with other constructs. Similarly, the maximum shared variance (MSV) is recommended to be lower than AVE but greater than the average shared variance (ASV). The obtained results indicated that the scales' discriminant validity is satisfactory (Fornell and Larcker, 1981). Table 4 demonstrates that each measurement variable is distinct and discriminant from one another.

4.5. Path coefficient and structural model analysis

Bootstrapping with 5000 subsamples from the original data set was used to assess the quality of the structural model (Henseler et al., 2009). The results of the structural model are shown in Figure 2. The coefficient of determination, known as R-Squared, is a statistical parameter in a model that shows how much variance in the dependent variable is explained by the independent variables. In other words, R² indicates the predictive power of the model. The R² value for purchase intentions is 0.582, which indicates 58.20% of the variance in purchase intentions while other variables influence the remaining 41.80%. Moreover, the R² value for attractiveness is 0.557, trustworthiness is 0.557, expertise is 0.589, and parasocial relationships is 0.503. All of the R² values met the threshold of 0.20 as recommended by Cohen (1988). The relationship and influence of the independent variables on the dependent variable were described by the structural model (path coefficient). The SEM method, particularly the maximum likelihood estimation, can effectively examine complex models and identify multiple connections among multi-item variables and mediating effects (Berraies et al., 2017). The β of path coefficient demonstrates the direct influence of the latent predictor variable on the predicted variables, with a large effect size of greater than 0.350, a medium effect size of between 0.350 to 0.150, and a small effect size of less than 0.150 (Cohen, 1988; Aparicio et al., 2021). The effect sizes of the path coefficient values of this model are shown in Figure 2 and Table 5.

The goodness of fit of a variance-based model is indicated by SRMR (standardized root mean square residual) (Henseler and Sarstedt, 2013). The SRMR is a fit measure that is defined as the standardized difference between the observed and predicted correlations. It is a positively biased measure where the bias is greater for small N and for low df studies. As the SRMR is an absolute measure of fit, a value of zero indicates a perfect fit. The SRMR has no penalty for model complexity. Generally, a value of less than 0.08 is considered a good fit (Hu and Bentler, 1999; Henseler and Sarstedt, 2013). The results of this study had an SRMR of 0.072.

4.6. Hypothesis testing for direct effects

All of the path coefficients and hypotheses are presented in Figure 2, Figure 3, and Table 5. It was found that expertise positively and

Table 2. Common method variance via single factor.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loading		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
<u>1</u>	16.285	46.527	46.527	16.285	46.527	46.527
<u>2</u>	3.038	8.681	55.208			
<u>3</u>	1.736	4.959	60.167			
<u>4</u>	1.315	3.759	63.926			

Extraction Method Principal Axis Factoring.

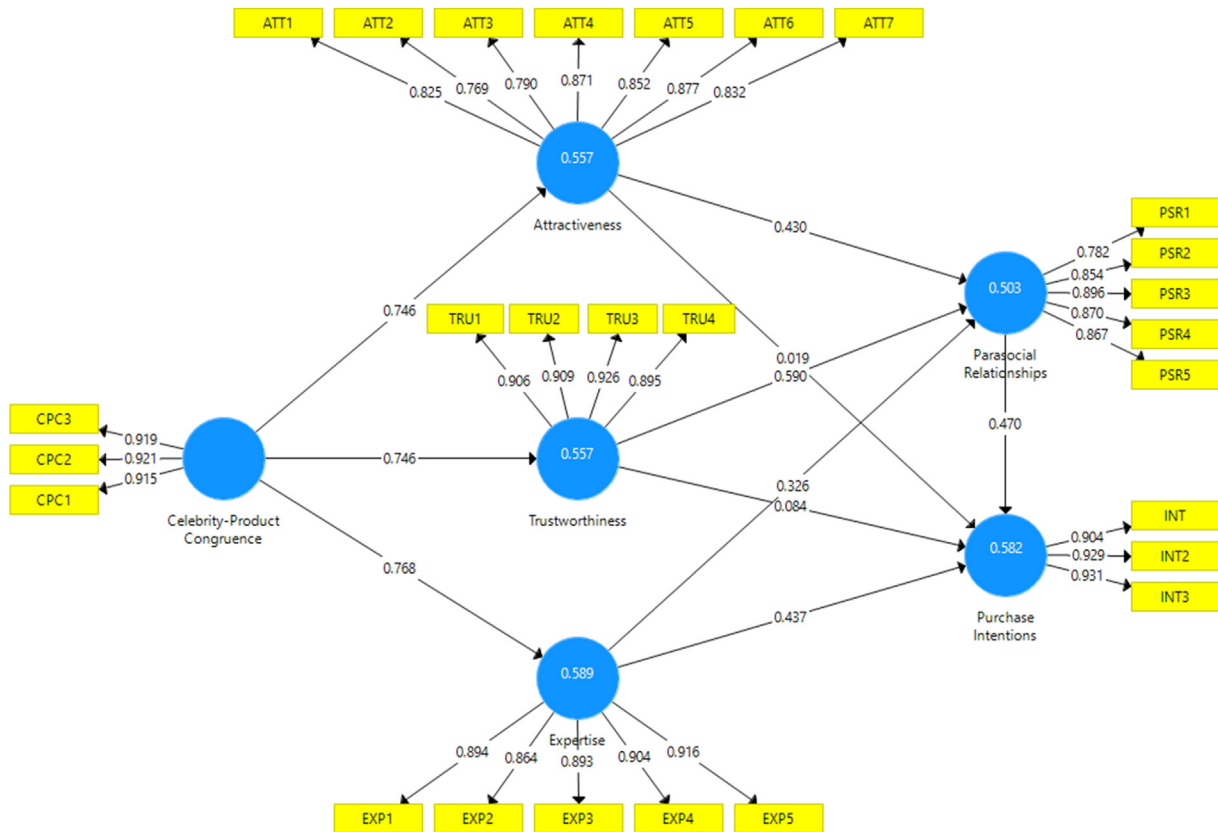


Figure 2. Results of R-Squared, path coefficient and standardized item loadings.

significantly influences purchase intentions with a large effect size ($\beta = 0.437, t = 4.286, p\text{-value} < 0.001$). Thus, the hypothesis (H3) was tested and accepted. However, for (H1 and H2), the results showed that attractiveness ($\beta = 0.019, t = 0.163$) and trustworthiness ($\beta = 0.084, t = 0.594$) have no significant influence. For (H4a and H5a), attractiveness and trustworthiness were found to have a positive influence on parasocial relationships with a medium effect size ($\beta = 0.430, t = 3.390, p\text{-value} < 0.001$) and ($\beta = 0.590, t = 5.215, p\text{-value} < 0.001$), indicating that these hypotheses were accepted. Moreover (H6a) was accepted, considering that expertise has a significant influence on parasocial relationships with a medium effect size ($\beta = 0.326, t = 2.633, p\text{-value} < 0.01$). For the hypothesis (H7), parasocial relationships positively affect purchase intentions ($\beta = 0.470, t = 8.002, p\text{-value} < 0.001$) with a large effect size. Finally, celebrity-product congruence was found to positively and significantly affect attractiveness ($\beta = 0.746, t = 26.730, p\text{-value} < 0.001$), trustworthiness ($\beta = 0.746, t = 26.322, p\text{-value} < 0.001$), and expertise ($\beta = 0.768, t = 28.262, p\text{-value} < 0.001$) with a large effect size. Therefore, the proposed hypotheses (H8a, H9a and H10a) were supported.

4.7. Hypothesis testing for mediating effects

In this study, the mediating effects of parasocial relationships, attractiveness, trustworthiness, and expertise were analyzed and ascertained using the bootstrapping method. The bootstrapping technique was first proposed by Preacher and Hayes (2008) as a tool for examining the indirect impacts of various variables. It is particularly important to obtain accurate results while calculating the indirect relationships' confidence intervals (CIs), as recommended by Baron and Kenny (1986). In this study, as bootstrapping is a powerful tool for testing indirect effects, 5000 subsample bootstrapping in bias-corrected confidence interval at 95% was used to obtain the results (Hayes, 2009; Williams and MacKinnon, 2008). A mediating effect is present, if the 95% bootstrap confidence

interval does not straddle a 0 between the upper and lower intervals (Preacher and Hayes, 2008). Moreover, this study applied an analytical method recommended in the literature (Nitzl et al., 2016; Aparicio et al., 2021) to compute the variance accounted for (VAF). According to Aparicio et al. (2021), the VAF value of less than 0.2 shows no mediating effect, the VAF value of between 0.2 and 0.8 shows a partial mediation, and the VAF value of greater than 0.8 indicates a full mediation.

From the results (Table 6), it was found that attractiveness has no significant direct effect on purchase intentions, but significantly indirectly affects purchase intentions. Parasocial relationships were found to have a full mediating role in the relationship between attractiveness and purchase intentions (VAF = 0.912, CI = 0.074, 0.323), indicating that the proposed hypothesis (H4b) was supported. Trustworthiness also has an insignificant direct impact on purchase intentions, but significantly indirectly affects purchase intentions. Also, parasocial relationships have a full mediating effect on the relationship between trustworthiness and purchase intentions (VAF = 0.823, CI = 0.175, 0.389). Thus, the proposed hypothesis (H5b) was accepted. In addition, it was found that expertise has both a significant direct and indirect effect on purchase intention. Parasocial relationships were found to have a partial mediating effect on the relationship between expertise and purchase intentions (VAF = 0.260, CI = -0.281, -0.050), indicating that the hypothesis (H6b) was accepted. Furthermore, expertise has a mediating role in the relationship between celebrity-product congruence and purchase intentions (VAF = 0.537, CI = 0.181, 0.469). Therefore, the proposed hypothesis (H10b) was accepted. However, H8b and H9b were rejected because the results showed that attractiveness and trustworthiness have no mediating role in the relationship between celebrity-product congruence and purchase intentions (VAF = 0.023, CI = -0.168, 0.143) and (VAF = 0.101, CI = -0.157, 0.254).

Furthermore, the mediation effect test provided additional interesting results as follows: (1) the positive relationship between celebrity-product congruence and purchase intentions is serially mediated by the

Table 3. Measurement model, results of standardized item loadings, construct reliability and convergent validity.

Constructs	Items	Loading (>0.6)	CA (>0.9)	AVE (>0.5)	CR (>0.8)
Purchase Intentions	INT1: Products recommended by the famous internet celebrity are worth buying.	0.904	0.911	0.849	0.944
	INT2: You are willing to buy famous internet celebrity's products on Taobao live stream	0.929			
	INT3: You will buy famous internet celebrity's products on Taobao live stream	0.931			
Attractiveness	ATT1: The famous internet celebrity has a strong attractiveness.	0.825	0.925	0.692	0.940
	ATT2: The famous internet celebrity has a very beautiful face.	0.769			
	ATT3: The famous internet celebrity has very beautiful lips.	0.790			
	ATT4: The famous internet celebrity has a very persuasive voice.	0.871			
	ATT5: The famous internet celebrity has a very professional manner.	0.852			
	ATT6: The famous internet celebrity catches your attention.	0.877			
	ATT7: The famous internet celebrity is a style icon.	0.832			
Trustworthiness	TRU1: The famous internet celebrity is a sincere person.	0.906	0.930	0.826	0.950
	TRU2: The famous internet celebrity is an honest person.	0.909			
	TRU3: The famous internet celebrity is trustworthy.	0.926			
	TRU4: The famous internet celebrity is a reliable source of information.	0.895			
Expertise	EXP1: The famous internet celebrity has expertise in her/his field.	0.894	0.937	0.800	0.952
	EXP2: The famous internet celebrity has product experience.	0.864			
	EXP3: The famous internet celebrity has extensive product knowledge.	0.893			
	EXP4: The famous internet celebrity has high professional sales qualifications.	0.904			
	EXP5: The famous internet celebrity has skills about this product/brand.	0.916			
Celebrity-Product Congruence	CPC1: The characteristics of the famous internet celebrity is consistent with the attributes of the product that she/he promotes and sells.	0.915	0.907	0.843	0.942
	CPC2: The product attributes that the famous internet celebrity promotes and sells are highly appropriate for her/him.	0.921			
	CPC3: The pairing of the famous internet celebrity with the product is natural.	0.919			
Parasocial Relationship	PSR1: You feel comfortable about the famous internet celebrity's words on Taobao live streaming.	0.782	0.907	0.730	0.931
	PSR2: You want to have a cordial conversation with the famous internet celebrity.	0.854			
	PSR3: You can identify the personality of the famous internet celebrity.	0.896			
	PSR4: You like to talk about the famous internet celebrity with other people.	0.870			
	PSR5: When something bad about the famous internet celebrity appears in the media, You feel bad.	0.867			

Note: CA = Cronbach's Alpha, AVE = Average Variance Extracted, CR = Composite Reliability.

attractiveness connection and by the parasocial relationships (CPC- > ATT- > PSR- > INT), (2) the positive relationship between celebrity-product congruence and purchase intentions is serially mediated by the trustworthiness connection and by the parasocial relationships (CPC- > TRU- > PSR- > INT), and as (3) the positive relationship between celebrity-product congruence and purchase intentions is also serially mediated by the expertise connection and by the parasocial relationships (CPC- > EXP- > PSR- > INT).

5. Discussion and conclusions

5.1. Discussions

This study examined the role of internet celebrities, which has become a topic of interest in research and marketing practice in recent

Table 4. Results of discriminant validity.

	ATT	CPC	EXP	PSR	INT	TRU
ATT	0.888					
CPC	0.746	0.918				
EXP	0.887	0.768	0.894			
PSR	0.665	0.481	0.576	0.855		
INT	0.755	0.622	0.764	0.766	0.922	
TRU	0.832	0.746	0.881	0.685	0.774	0.909

Bold values indicate square root of AVE in the diagonal.

years. The Chinese internet celebrity sector has been constantly growing and incorporating promotion, especially live streaming, which is the most recent selling strategy for social commerce sellers. Due to its real-time nature, customers are allowed to have productive, fun, and impressive shopping experiences that overcome the disadvantages of traditional online shopping. The main objectives of this study were (1) to explore what kinds of celebrity characteristics are most likely to generate strong purchase intentions, (2) to investigate the underlying mechanisms through which celebrity characteristics influence purchase intentions by focusing on the mediating role of parasocial relationships, (3) to study the influence of celebrity-product congruence on celebrity characteristics, and (4) to empirically examine the relationship between celebrity-product congruence and purchase intention that is mediated by celebrity characteristics.

The results indicated that the celebrity endorsers' perceived attractiveness does not influence consumers' purchase intentions, which seems to be the opposite of the hypothesis. However, this finding supports the previous research results of [Till and Busler \(1998\)](#) and [Park and Lin \(2020\)](#), which suggested that charming celebrity endorsers' favorable feelings do not necessarily affect other customers' purchases, which indicates that celebrities' appearances have nothing to do with buying decisions. In addition, [Levi et al. \(2017\)](#) stated that not all terribly attractive endorsers can generate positive advertising outcomes, and those with low self-esteem may identify more with the advertising model that is less appealing, because of the potential interaction between consumers' psychological states and model attractiveness. Moreover, the results also showed that an internet celebrity endorsers' perceived

Table 5. Results of hypothesis testing.

Hypothesis & Path	Path Coefficients	t statistic	p-value	Result
H1: Attractiveness → Purchase Intentions	0.019 ^{ns.}	0.163	0.861	Not Supported
H2: Trustworthiness → Purchase Intentions	0.084 ^{ns.}	0.594	0.550	Not Supported
H3: Expertise → Purchase Intentions	0.437 ^{***}	4.286	0.000	Supported with large effect
H4a: Attractiveness - > Parasocial Relationships	0.430 ^{***}	3.390	0.001	Supported with large effect
H4b: Attractiveness - > Parasocial Relationships - > Purchase Intentions	0.202 ^{**}	2.938	0.003	Supported with medium effect
H5a: Trustworthiness - > Parasocial Relationships	0.590 ^{***}	5.215	0.000	Supported with large effect
H5b: Trustworthiness - > Parasocial Relationships - > Purchase Intentions	0.278 ^{***}	4.905	0.000	Supported with medium effect
H6a: Expertise - > Parasocial Relationships	0.326 ^{**}	2.633	0.006	Supported with medium effect
H6b: Expertise - > Parasocial Relationships - > Purchase Intentions	0.153 ^{**}	2.658	0.008	Supported with medium effect
H7: Parasocial Relationships - > Purchase Intentions	0.470 ^{***}	8.002	0.000	Supported with large effect
H8a: Celebrity-Product Congruence → Attractiveness	0.746 ^{***}	26.730	0.000	Supported with large effect
H8b: Celebrity-Product Congruence - > Attractiveness - > Purchase Intentions	0.015 ^{ns.}	0.175	0.861	Not Supported
H9a: Celebrity-Product Congruence → Trustworthiness	0.746 ^{***}	26.322	0.000	Supported with large effect
H9b: Celebrity-Product Congruence - > Trustworthiness - > Purchase Intentions	0.063 ^{ns.}	0.595	0.552	Not Supported
H10a: Celebrity-Product Congruence → Expertise	0.768 ^{***}	28.262	0.000	Supported with large effect
H10b: Celebrity-Product Congruence - > Expertise - > Purchase Intentions	0.335 ^{***}	4.468	0.000	Supported with medium effect

Note: *** = p-value ≤ 0.001, ** = p-value ≤ 0.01, * = p-value ≤ 0.05, ns. = not-significant.

Effect size >0.350 = large, > 0.150 and <0.350 = medium (Cohen, 1988; Aparicio et al., 2021).

trustworthiness does not significantly affect purchase intentions. When compared with the research by Park and Lin (2020), which was carried out in the same context and with similar participants in different countries, the results are different. Therefore, it is important to note that consumers who have the same nationality but live in different countries with different social, cultural, and environmental contexts have different perceptions of celebrity credibility, which finally lead to different purchase intentions. Moreover, it was found that consumers acknowledge internet celebrities' deficiency of trustworthiness concerning the product they endorse, and it is possible that many internet celebrities may not actually use the product, but are hired to introduce and sell it. Internet

celebrities appear to be the sources of motivations and recommendations for digital consumers (Casaló et al., 2018). On the contrary, the results indicated that a celebrity endorsers' perceived expertise is the vital factor of Chinese consumers' purchase intentions on Taobao live streaming. This finding extends the current body of knowledge in the research of Park and Lin (2020), which investigated the behavior of Chinese consumers in the context of live streaming commerce but did not include the expertise of celebrities in the study. According to the results of the present research, internet celebrities with more expertise have been proven to generate more purchase intentions. Thus, internet celebrities should have knowledge about a particular product because, with this

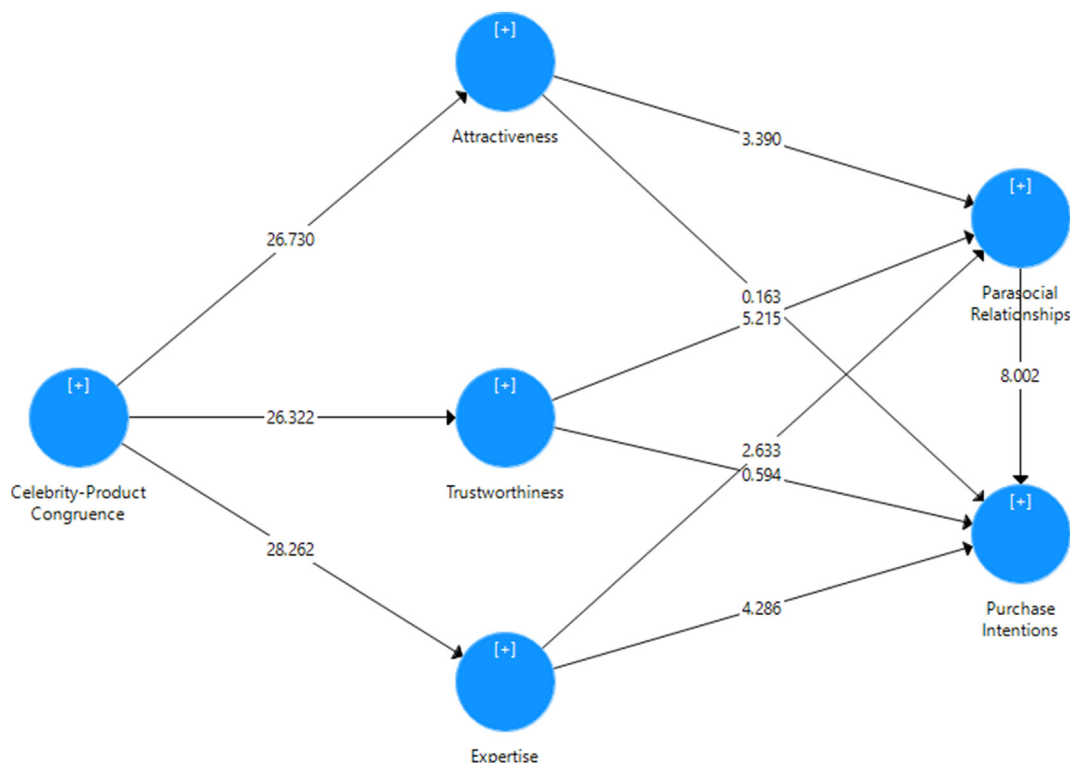


Figure 3. Results of structural model.

Table 6. Multiple mediation analysis.

Path	Indirect effects	Total effects	VAF	Confidence Interval		Mediation
				Bootstrap 95% 2.5%	97.5%	
ATT → PSR → INT	0.202	0.222	0.912	0.074	0.323	Full Mediation
CPC -> TRU -> PSR -> INT	0.207	0.624	0.332	0.135	0.297	Partial Mediation
CPC -> ATT -> PSR	0.321	0.511	0.628	0.127	0.500	Partial Mediation
EXP -> PSR -> INT	0.153	0.590	0.260	-0.281	-0.050	Partial Mediation
CPC -> TRU -> INT	0.063	0.624	0.101	-0.157	0.254	No Mediation
CPC -> EXP -> PSR	0.250	0.511	0.490	-0.442	-0.086	Partial Mediation
CPC -> TRU -> PSR	0.441	0.511	0.862	0.276	0.595	Full Mediation
CPC -> ATT -> PSR -> INT	0.151	0.624	0.242	0.053	0.246	Partial Mediation
CPC -> ATT -> INT	0.015	0.624	0.023	-0.168	0.143	No Mediation
CPC -> EXP -> INT	0.335	0.624	0.537	0.181	0.469	Partial Mediation
TRU -> PSR -> INT	0.298	0.362	0.823	0.175	0.389	Full Mediation
CPC -> EXP -> PSR -> INT	0.158	0.624	0.253	-0.220	-0.041	Partial Mediation

Note: 1. VAF would be smaller than 0.2 in the presence of a significant indirect effect.

(VAF <0.2 = no mediation; $0.2 \leq \text{VAF} \leq 0.8$ = partial mediation; VAF >0.8 = full mediation) (Aparicio et al., 2021).

2. Mediation effects were present when the 95% bootstrap confidence interval did not straddle a 0 between the upper and lower intervals. (Preacher and Hayes, 2008).

knowledge, they can better convince consumers than other endorsers who do not have expertise.

The second finding showed that celebrity endorsers' perceived attractiveness, trustworthiness and expertise have a positive influence on parasocial relationships. This finding supports the previous research results of Lou and Kim (2019). The celebrity endorsers' perceived attractiveness, trustworthiness and expertise are essential for persuading consumers to form parasocial relationships and leads to a stronger formation of a parasocial relationship between the follower and the celebrity. Moreover, an interesting new finding about the mechanisms by which parasocial relationships mediate the relationship between celebrity characteristics (attractiveness, trustworthiness, and expertise) and purchase intentions is presented in this study. In the realm of live streaming commerce, although the celebrity endorsers' perceived attractiveness and trustworthiness of famous internet celebrities have no significant direct effect on purchase intentions, they significantly indirectly affect purchase intentions through parasocial relationships. It is important to note that many previous studies have only focused on selecting celebrities with attractive features such as pretty skin tone, beautiful faces, and physical appeal, whereas the present research found that celebrity endorsers' perceived attractiveness and trustworthiness alone are not enough to make live streaming commerce succeed, and that it is critical to form parasocial relationships with consumers as well. Chinese consumers do not just want internet celebrity endorsers with attractive appearances as a reliable source of information; they also want an endorser who can use her/his unique beauty to provide honest information through friendly communication, just like a friend.

In addition, this study provides initial evidence that parasocial relationships have a positive influence on purchase intentions. The findings of this study support and extend the current body of knowledge concerning the parasocial relationship concept, which has been frequently used in previous research to explore the relationship between digital celebrities and their followers on social network sites. The present research is among the first to apply this concept in the context of live streaming commerce. The concept of parasocial relationships has become widely used to explain relationships that are similar to interpersonal relationships and to reflect intimate feelings that originate in certain social relationships (Dibble et al., 2016). When using live streaming commerce, consumers feel more safe and secure sharing their personal information. Parasocial relationships on live streaming commerce enable consumers to form pseudo-friendships while reducing anxiety in their real-life interpersonal relationships (Capland and Turner, 2007).

Furthermore, the major finding showed that celebrity-product congruence can improve perceived celebrity characteristics, including attractiveness, trustworthiness, and expertise, which supports the hypotheses with a large effect. This finding extends the current body of knowledge because the majority of previous studies have looked at the congruence between products and celebrities by focusing only on physical attractiveness. In addition, the research by Park and Lin (2020), which was conducted in the same context, also placed emphasis on celebrity-product congruence and celebrities' attractiveness and trustworthiness only, without paying attention to a linkage between celebrity-product congruence and perceived celebrity expertise. Importantly, the present study found that celebrity-product congruence has the highest impact on perceived celebrity expertise. In other words, celebrity-product congruence can enhance a celebrity's expertise in the field that she/he represents and can affect consumers' perceptions of a celebrity's professional qualifications. Furthermore, contrary to the meaning transfer model, the celebrity endorsement model, introduced by McCracken in 1989, describes how favorable perceptions that audiences have of celebrities can be transferred to the products being endorsed by the celebrities. Advertising endorsements can be successful when the endorser's characteristics match those of the product. However, the results of this research found the reverse transfer effect of celebrity-product congruence on the internet celebrity that if celebrity-product incongruence can decrease consumers' overall positive opinions of the celebrity, then the celebrity endorsers' perceived attractiveness, trustworthiness, and expertise can be negatively affected by celebrity-product incongruence. As the majority of internet celebrities have a lower profile than traditional celebrities, they should be more aware of celebrity-product congruence and the reverse flow. This reverse flow of personality from the brand to the celebrity can happen when the product/brand is strong but the celebrity is not (Roy and Moorthi, 2012; Yang, 2018). This reverse transfer effect is an interesting but little-understood phenomenon, especially in the realm of live streaming.

Finally, regarding the mediating effect results, the findings of this study build on and extend existing knowledge proposed by Jaffari and Hunjra (2017), who studied the mediating role of celebrity effective endorsement in the effect of celebrity-product congruence on purchase intentions, which solely provided an overview of celebrity effective endorsement but did not describe how different celebrity characteristics and celebrity-product congruence had positive or negative effects on purchase intentions, the present research clearly elucidated each of the three main characteristics of celebrities and revealed that celebrities'

expertise could mediate the relationship between celebrity-product congruence and purchase intentions, while celebrity endorsers' perceived attractiveness and trustworthiness have no mediating effect. Thus, expertise is considered a very important factor for selling products through live streaming commerce.

5.2. Theoretical contributions

This study verifies and extends existing research findings and also provides several key theoretical implications. First, the relationship between the match-up hypothesis and the parasocial relationship theory has not been studied in the past, but the match-up hypothesis has been used to explain the relationship between celebrity-product congruence and source credibility. Meanwhile, the parasocial relationship theory has been used to study the relationship between parasocial relationships and source credibility, and various studies have found that source credibility is essential for persuading consumers to form parasocial relationships. Based on the above information, this research intends to extend the current body of knowledge and propose new research findings by using the source credibility model to connect the match-up hypothesis and the parasocial relationship theory and by integrating these three concepts into a conceptual framework to bridge the research gaps in purchase intention studies. The present research provides a new theoretical finding that the source credibility model has a mediating effect on the relationship between the match-up hypothesis and the parasocial relationship theory (Match-up hypothesis → Source credibility model → Parasocial relationship theory).

Second, when integrating the source credibility model and the parasocial relationship concept to investigate consumers' purchase intentions (Source credibility model → Parasocial relationships → Purchase intention), it was found that parasocial relationships have a complete mediating effect on the relationship between celebrity characteristics and purchase intentions. Moreover, it was found that celebrity endorsers' perceived attractiveness and trustworthiness have no direct effect on purchase intentions but indirectly affect them through parasocial relationships. Hence, it can be concluded that, in the context of live streaming commerce, apart from having attractiveness and trustworthiness, celebrities must have the ability to form parasocial relationships with consumers as well.

Third, when combining the match-up hypothesis and the source credibility model to study consumers' purchase intentions (Match-up hypothesis → Source credibility model → Purchase intentions), it was found that only celebrity endorsers' perceived expertise can mediate the relationship between celebrity-product congruence and purchase intentions, while celebrity endorsers' perceived attractiveness and trustworthiness have no mediation effect. These results help to extend previous findings, which overall indicated the mediating role of celebrity effective endorsement but did not clearly specify which celebrity characteristics have mediating effects on celebrity-product congruence and purchase intentions. Thus, from the results of this research, it can be said that, in the context of live streaming commerce, consumers place the greatest importance on a celebrity with knowledge and expertise in selling endorsed products.

Finally, the integration of the three above theories led to the study of consumers' purchase intentions on Taobao live streaming commerce through the influence of celebrity-product congruence, celebrity characteristics, and parasocial relationships. This study yields an interesting theoretical finding: a positive relationship between celebrity-product congruence and purchase intentions is serially mediated by celebrity characteristics and parasocial relationships (celebrity-product congruence → perceived celebrity characteristics → parasocial relationships → purchase intentions). Therefore, it can be concluded that these three theories are serially related in the context of live streaming commerce through the influence of two mediating variables, which are perceived celebrity characteristics (attractiveness, trustworthiness, and expertise) and parasocial relationships.

5.3. Managerial implications

Considering managerial implications, this study provides useful information for live streaming commerce, especially for cosmetic products. Live streaming commerce will become commonplace, and it will not go away with the end of the pandemic. Consumers would progressively embrace live streaming after this pandemic, and marketers would be comfortable with the live streaming operating procedure. Live streaming will become more refined and standardized over time. In the long term, market competition will shift from price competition to compete with the ability of internet celebrities. In the future, marketers who are able to choose effective internet celebrity endorsers will also win. Marketers should think of ways to employ celebrities in their product marketing and sales and create techniques for determining which sorts of online celebrities are most effective and which product categories can be effectively marketed or sold by them.

A trap for marketers in choosing an endorser of their product is that they usually focus more on the celebrity endorsers' perceived attractiveness and trustworthiness of internet celebrities. However, in reality, celebrity endorsers' perceived attractiveness and trustworthiness alone may spark consumer interest in the selected internet celebrity and the endorsed product, but they have no influence on the purchase intentions of consumers. In the context of live streaming commerce, where products are sold in real time, consumers need celebrity endorsers who can have fun and friendly conversations with them, talk to them like friends, and clearly answer their questions with cordial manners. Therefore, parasocial relationships are considered a factor that should be taken into account. Marketers should focus on building strong parasocial relationships with consumers, which will lead to consumers' purchase intentions. Moreover, they must promote such parasocial relationships by providing internet celebrities with information about their endorsed brands or products so that they can give clear explanations when consumers/followers ask them for more product details. Parasocial relationships can be strengthened through effective communication between internet celebrities and consumers. Consumers are more likely to trust recommendations from friends, and they view internet celebrities as their friends, so it is essential for marketers to cultivate a close, friendly relationship between celebrities and consumers. The concept of parasocial relationships applies well to celebrity-follower relationships. As internet celebrities or influencers foster reciprocal relationships by consistently producing live content and communicating with consumers, the consumers can form a lasting socio-emotional attachment to the internet celebrities.

Moreover, when the internet celebrity's image or personality is consistent with the product, her/his expertise can be strengthened. A good fit between an endorser and a product can boost consumer purchase intention and business performance by raising perceptions of the endorser's expertise. Therefore, marketers should prioritize recruiting an endorser with expertise in cosmetic products over one who is attractive or trustworthy. The expertise of endorsers is a critical factor to consider. The internet celebrity who has given expert opinions on cosmetic products should be selected as a spokesperson for those products. The meaning of "expertise" here includes high professional sales qualifications. As a live broadcast is more like a talk show, speech rhythm, topics, and interactive forms must be professional and require strong communication skills. Internet celebrity endorsers must be either familiar with the products they sell, eloquent and particularly good at chatting, or relatively influential. They might be given a limited time of just 2 min, but those 2 min might be important in providing customers with product information and allowing them to place orders right away.

Furthermore, celebrity-product congruence can improve perceived celebrity characteristics, including attractiveness, trustworthiness, and expertise. If celebrity-product incongruence can decrease consumers' overall positive opinions of a celebrity, then the celebrity endorsers' perceived attractiveness, trustworthiness, and expertise can be negatively affected by celebrity-product incongruence. As the majority of internet celebrities have a lower profile than traditional celebrities, they

should be more aware of celebrity-product congruence and the reverse flow. This reverse flow of personality from the brand to the celebrity can happen when the product/brand is strong but the celebrity is not. Thus, marketers should place importance on choosing an internet celebrity that matches the product's image. In other words, the characteristics of the internet celebrity should be consistent with the attributes of the product that she/he promotes and sells.

In summary, there are three steps in planning an internet celebrity strategy to successfully optimize sales through a live streaming channel: 1) creating celebrity-product congruence, 2) developing celebrities' expertise, and 3) building parasocial relationships. In the first step, marketers should recruit or select internet celebrities whose image is consistent with the product being sold. For example, to endorse facial cosmeceuticals with a credible image, marketers must choose an internet celebrity who has a credible personality and expertise in facial care, as celebrity-product congruence can improve perceived celebrity characteristics. For the second step, marketers should develop the selected internet celebrities into specialists in the endorsed product. For example, marketers should provide cosmetic training to the celebrities who endorse cosmetic products and have them try the real items so that they are deeply familiar with those products and are able to answer in-depth questions and clearly explain their actual product experiences. Marketers should develop internet celebrities to have insightful knowledge about the products they endorse and be able to answer beauty questions like a beauty advisor using professional tone, speech rhythm, and sales skills. In the last step, it is essential to build strong consumer-celebrity parasocial relationships in the long run. Marketers should advise celebrities to build relationships with consumers through entertaining conversations during their live sessions, rather than just acting as sales representatives for the brand, or else consumers may have a bad impression of those celebrities, which can influence their purchase decisions. Furthermore, marketers should foster friendly relationships between celebrities and consumers like they are close friends who can casually talk to each other, answer various questions, and send invitations to join fun games together. Importantly, celebrity endorsers should be approachable and down to earth.

Finally, this study offers insights to other social commerce platforms, such as Facebook Marketplaces, and e-market places, such as Lazada and Shopee, that use live streaming to sell products. These platforms apply similar live streaming patterns. They use internet celebrities or influencers to show and review products and chat with consumers like they are friends. Therefore, the results of this study can be applied to various social media commerce platforms that use live streaming as a sales channel.

5.4. Limitations and future research

This study merely highlighted Chinese consumers; external validity may be further supported by sampling customers in other countries. In addition, this research was limited to the cosmetic product category without taking into account additional particular merchandise details, such as pricing or merchandise genre. Thus, future studies should be conducted with various kinds of celebrities and should specify product types and price ranges in order to obtain more accurate results.

Live streaming is faring well for future research. However, as more individuals flood into the market, competition among live broadcasters is becoming fierce. In an interview, Li Jiaqi, who is known as the top brother of lipstick, stated that he could not take a break in spite of the fact that he was unwell, since a number of live programs are broadcasted on Taobao every day. He additionally emphasized that "If I rest just for a day, my followers may switch to other live programs." This implies that audience retention is important for live streaming to compete in aggressive competition and ensure long-term success. Therefore, it is interesting to study whether there are factors that affect customer loyalty and evangelism in live streaming commerce. Finally, further research might explore the differences between the parasocial relationships of

conventional celebrities and their fans and the parasocial relationships of online celebrities and their followers. For example, further research can be done to examine the degrees and types of parasocial relationships that exist between traditional celebrities and their fans with those that exist between internet celebrities and their followers. Since there are many factors affecting parasocial relationships between internet celebrities and their followers in the context of live streaming commerce or social networking sites, additional research should be conducted to investigate emotional, communicational, and psychological factors that can influence parasocial relationships.

Declarations

Author contribution statement

Warinrumpai Rungruangjit: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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