Effects of in-store live stream on consumers' offline purchase intention

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ABSTRACT

Live stream marketing through social media has attracted the attention of digital retailing marketers in recent years. However, there is a lack of evidence in understanding the influence of in-store live stream on offline purchase intentions. This study aimed to investigate the influence patterns of environmental stimuli on consumers' intention to purchase offline/in-store after watching an in-store live stream session. The Stimuli-Organism-Response (SOR) model was employed as the theoretical framework, and a structured questionnaire was used to collect data from individuals who had previous experience with in-store live stream marketing. Structural equation modelling was then applied for data analysis, with a total of 234 valid responses. The findings revealed that environmental stimuli have a significant positive effect on consumers' intentions to make in-store purchases, and the attitudes towards influencers and products substantially mediate the relationship between stimuli and purchase intention. More specifically, consumer attitude towards products has a pronounced effect on whether they will make an in-store purchase. The novelty of this research lies in its investigation of the impact that live stream marketing has on offline or in-store shopping experiences. This contrasts with the majority of existing live stream studies, which focus on consumers' online shopping experiences. In addition, this study broadens the scope of the application of the SOR model to contribute to the growing body of literature on live stream marketing.

1. Introduction

Social media has given rise to a huge number of influencers and followers. The *social media influencers* are also known as online celebrities. They produce interesting content to build social networks and attract other social media users to follow them (Shan et al., 2020). Businesses and marketers these days use social media influencers extensively to attract potential buyers (Martínez-López et al., 2020).

Unlike text-only posts or video blogs on social media, which always involve editing before posting, *live streaming* on social media is considered by many Internet users to be a more reliable source and has accordingly gained popularity over other marketing channels (Ma, 2021). In China, for example, live stream marketing has attracted the attention of more than 703 million people, or around 68.2% of all Internet users (China Internet Network Information Center, 2022). Live streaming allows the influencer to demonstrate different aspects of

products or services in real-time, and the audience can ask questions or interact with the influencer during the live stream session (Hu and Chaudhry, 2020). This triggers the audience's perception of authenticity, visualisation, and interactivity (Hu and Chaudhry, 2020). The co-creation of value by social media influencers and companies thus achieves a win-win situation (Ma, 2021).

Live stream marketing can be used in various product categories, such as general or fashion shopping, tourism, eating out at restaurants, make-up tutorials, and talent shows (Wongkitrungrueng and Assarut, 2018). An influencer's endorsement and marketing strategy assist businesses and entrepreneurs in efficiently generating fast sales (Luo et al., 2021). Interest in studying live stream marketing has been growing rapidly over the past few years (Cai and Wohn, 2019; Hu and Chaudhry, 2020; Wongkitrungrueng and Assarut, 2018). Prior research predominantly explored the effects of consumers' engagement on online live stream shopping experiences (Ang et al., 2018; Hu and Chaudhry,

2020; Wongkitrungrueng and Assarut, 2018; Wongkitrungrueng et al., 2020). Other related aspects, such as the effects of gender on consumers' decision-making processes (Todd and Melancon, 2018), sponsorship disclosure (Kay et al., 2020), emotional engagement (Lim et al., 2020), product endorsement (Park and Lin, 2020) and consumer satisfaction (Ma, 2021), were studied too.

While live stream shopping has emerged as a platform for purchasing that is both quick and simple for followers, it has also rapidly evolved into a marketing tactic that allows influencers to simulate the experience of shopping in a store without viewers having to leave their homes (Liu et al., 2021). This gives rise to *in-store live streaming*, which has contributed to bridging the gap between traditional offline marketing and sophisticated online marketing, as well as boosting the social presence of online shopping (Clement Addo et al., 2021). There are contexts or situations when online purchases during a live stream session are not possible. For example, as an eating-out influencer carries out in-store live streaming in a restaurant, viewers must visit the restaurant in person to taste the food and enjoy the service. In cases like this, viewers first seek useful online information and necessary details from the influencer before making in-store or offline purchases. Therefore, academics and industry practitioners alike should not overlook the importance of live stream marketing for offline or in-store purchasing. Despite the importance, no prior work in the extant literature on live stream influencer marketing has investigated its effects on consumers' offline or in-store purchase intentions. Looking into this is vital especially for the tourism and hospitality industries.

This research aims to address the above gap by exploring the effects of in-store live stream on consumers' decision-making about in-store or offline purchases. The live streaming of influencers on social media may be thought of as a stimulus, and the behaviour of consumers who respond by purchasing the products or services they watch streamed—may it be on the spot or later—can be thought of as a behavioural response. The Stimuli-Organism-Response (SOR) framework, used by several recent studies in the online retail marketing domain to understand consumers' online purchasing behaviour (Hu and Chaudhry, 2020; Ma et al., 2022; Ming et al., 2021), was therefore adopted to investigate the influence of live stream experiences on consumers' in-store or offline purchase decision-making processes in this study. The primary advantage of using this SOR model here is its ability to explain how individuals' emotional states (the organism) are influenced by different environmental elements and lead to their behavioural responses.

We considered four environmental stimuli, namely the para-social relationship, inspiration, informativeness and wishful identification. Each of the stimuli may cause emotional reactions in consumers towards influencers and products (the organism), which may in turn influence consumers' intentions to purchase (the response). These four environmental stimuli have been studied previously in traditional social media marketing research. For example, it has been found that in online retail and television marketing, para-social relationships, informativeness and wishful identification can affect consumers' attitudes and purchase intentions (Gao and Koufaris, 2006; Reinikainen, Munnukka, Maity, & Luoma-aho, 2020; Shan et al., 2020). Inspiration has primarily been examined in the contexts of psychology and art, but limited relevant work can be found in social media marketing research (Izogo and Mpinganjira, 2020). The main objectives of this research are (1) to examine what factors in stimuli will affect the organism (consumer attitude), (2) to explore consumers' offline/in-store purchase intentions, and (3) to test the mediating effect of the organism (consumer attitude) in the relationship between different stimuli and consumer responses (purchase intentions).

The contributions of this work can be summarised as follows. First, this study contributes to the growing body of knowledge on live stream influencer marketing by shedding light on consumers' in-store or offline purchase intention, which has been completely overlooked by prior studies. Second, the findings of this study contribute to the

understanding of the relationship between environmental stimuli, consumers' attitudes towards influencers and products, and their in-store or offline purchase intentions. Moreover, this study broadens the scope of the SOR model by offering empirical evidence from the live stream marketing field within the context of the attitudes of followers towards products and influencers. A strong managerial contribution from the study is that we identified factors that can provide helpful insights for companies and brands as they develop marketing strategies to achieve better sales. The important performance map analysis (IPMA) evaluation included in this study also highlighted the contributions and differences from previous research, which identified that customer attitudes towards products are very important and trigger in-store or offline purchase intentions.

The remainder of this paper is organised as follows: In the next section, we review the literature and provide a theoretical background for the proposed framework. This is followed by an explanation of the methodology, the examination of the results, and discussions of the findings and contributions.

2. Literature review and development of hypotheses

2.1. Stimuli

According to the SOR framework, environmental stimuli can influence consumers' cognitive and affective states (Gao et al., 2021). In an online shopping environment, the stimuli may manifest in different forms, such as the appearance of the online store, the services provided, and the consumers' inner thoughts (Chan et al., 2017). In the prior literature on social media marketing, researchers have identified several factors that may affect consumers' intentions to purchase online. As mentioned above, each stimulus may cause emotional reactions in consumers towards influencers and products (the organism), which may then influence consumers' intentions to purchase (the response). Since in-store live streaming has its own particularities and has only recently become popular, it remains unknown whether the findings of research on social media marketing can be applied to this field. Drawing on the prior social media marketing literature, we have identified four environmental stimuli—para-social relationship, wishful identification, informativeness, and inspiration—in this study.

2.1.1. Para-social relationship (PSR)

The PSR is derived from para-social interaction (PSI), which is an illusion of interaction between a spectator and a performer (Sokolova and Kefi, 2020). In the context of this study, the performer and spectator could be seen as the influencer/streamer and customers/audience members, respectively. This type of interaction or relationship is always triggered when the streamer makes direct eye contact through the camera, making the audience feel a sense of intimacy with the streamer (Reinikainen et al., 2020). PSI or PSR can also be created when the streamer tells the audience that they are involved in a personal or informal conversation (Hartmann and Goldhoorn, 2011). Past studies suggested that PSI and PSR influence the audience's identity, attitude, and behaviour (Agnihotri and Bhattacharya, 2021; Breves et al., 2019; Jin and Ryu, 2020; Sokolova and Kefi, 2020). When customers or audience members perceive a higher level of PSI from the relationship with the streamer, it can help induce the customers or audience members to adopt the same product that the streamer uses (Agnihotri and Bhattacharya, 2021; Breves et al., 2019; Jin and Ryu, 2020; Sokolova and Kefi, 2020).

PSI focuses on one-sided interaction, meaning that audience members cannot communicate or interact with the performer directly. In contrast, PSR generates a two-way interaction (Reinikainen et al., 2020). Only PSI can be generated in traditional media, such as television and radio, because audience members cannot provide their feedback in real-time. Furthermore, audience members who form PSR often establish an interpersonal relationship with the influencer, which motivates

the audience to use the media in pursuit of satisfaction (Kim et al., 2015). In the context of this study, we propose that the friendly atmosphere the influencers create, as well as the live chat function, will generate PSR and may affect consumers' attitudes.

2.1.2. Wishful identification

Prior research suggested that people wish to be identified as those who share interests with role models or desire to be like others (Schouten et al., 2020; Shoenberger and Kim, 2019). In the context of marketing by social media influencers, consumers build their self-image by adapting desired attributes and symbolic meaning from the influencers (Shan et al., 2020). Researchers have termed this scenario 'wishful identification' and further explained that it is a process in which a person assumes the identity of a source character without losing his or her own identity (Hoffner and Buchanan, 2005). Schouten et al. (2020) stated that wishful identification can derive from both actual and perceived similarity. Prior studies suggested that viewers with a higher level of wishful identification can maintain a good relationship with and have loyalty to their influencers (Men and Tsai, 2013).

In contrast to traditional celebrities, influencers on social media platforms can lead consumers to experience a higher degree of wishful identification after perceiving more similarities and connections with influencers (Schouten et al., 2020). Furthermore, researchers have found that wishful identification can be strengthened if the advertised products fit well with consumers' own appearances and personalities (Hu et al., 2020). In a live stream marketing context, the live streamer acts like a friend to their followers, which provides the followers with the feeling that they have much in common. This feeling can lead them to think that if the product is suitable for the influencer, then it may also fit their own appearance and personality. Existing studies have examined wishful identification primarily based on non-live social media platforms; the effect of wishful identification on consumers' attitudes on live stream social media platforms remains unknown. This study intends to fill the gap.

2.1.3. Informativeness

Informativeness has been defined as the source of media providing additional or comprehensive product information to the user (Rotzoll et al., 1996). In marketing by social media influencers, followers evaluate the informativeness of a source based on several aspects: the degree of relevance and the timeliness, accuracy, and comprehensiveness of the content provided (Cheung and Thadani, 2012). Prior studies indicated that the informativeness of advertising content can influence consumers to make more rational decisions and give them more confidence in their decisions (Kang et al., 2020). Furthermore, in traditional and general social media marketing, the information provided by the marketers is limited by the form of the advertisement. For example, television advertisements are usually between 5 and 60 s in duration, and paper-based advertisements are restricted in space. Unlike these types of marketing, in-store live stream marketing can provide more information about the product. A live streamer can, for instance, describe the taste of dishes and tell the audience about personal experiences in the store.

In an online retail shopping context, informative content can enhance potential consumers' attitudes towards the website and product, draw their attention, and lead them to engage with the brand or company (Gao and Koufaris, 2006). Given that live stream influencer marketing shares features with both television and online retail website marketing, this study considers that the informativeness of the content could act as an environmental stimulus that affects consumers' attitudes.

2.1.4. Customer inspiration

In-store live streams show streamers' in-store experiences, which may inspire and motivate the audience to have that experience themselves. Researchers defined this type of motivational state as 'customer inspiration' (Böttger et al., 2017). Research on inspiration has attracted much interest from psychology and other areas, such as art, leadership, and theology (Izogo and Mpinganjira, 2020).

Recently, several studies have applied the concept of inspiration to consumer behaviour research using the more precise name of 'consumer inspiration' (Böttger et al., 2017; Izogo and Mpinganjira, 2020). These researchers suggested that consumer inspiration denotes consumers being stimulated by creative marketing content or a new idea (i.e., evocation) that can help them generate new possibilities and finally inspires them to actualise the new idea (Izogo and Mpinganjira, 2020).

In traditional marketing, customer inspiration increases consumers' brand attachment and strengthens consumer relationships with the brand (Böttger et al., 2017). In a live stream marketing context, the streamer always provides his or her audience with time-limited promotions and uses rich language to introduce each product. These strategies may inspire and encourage the audience to get involved in this marketing process. Therefore, we consider customer inspiration to be an environmental stimulus affecting consumers' attitudes.

2.2. Organism

The organism element in the SOR framework represents an individual's emotional state, encompassing feelings, attitude, involvement, and impulse-buying tendencies resulting from stimulating cues (Vazquez et al., 2020).

As the direct predictor of consumers' purchase intentions, an understanding of consumers' attitudes towards influencers and products is necessary to investigate the effects of influencer marketing (Chetioui et al., 2020). In traditional and online retail website marketing, consumers' attitudes towards products and brands have a direct impact on purchase intentions (Chetioui et al., 2020). Huang et al. (2011) concluded that positive consumer attitudes towards brands or products could predict purchase intentions.

When a consumer is highly engaged during the advertising process, the impact of attitudes on that consumer's behaviours is strengthened (MacKenzie et al., 1986). In a social marketing environment, a well-liked influencer can increase customer engagement, inducing customers to form favourable attitudes towards influencers and to associate their attitudes with their purchase intentions (Van Noort et al., 2012). Hence, favourable attitudes towards influencers may have positive effects on consumer responses (Belanche et al., 2021a). Thus, we suggest that consumers' attitudes towards influencers and products are the organism in this study.

2.3. Response

According to the SOR framework, the response element involves the consumer's positive behaviour in specific situations, such as their impulse buying, purchase intentions, and actual purchase behaviours (Xu et al., 2020). Consumer purchase intention is a crucial determinant of their actual purchasing behaviours (Chetioui et al., 2020). Consumer purchase intention is defined as the willingness of customers to purchase a product and is the primary indicator of the success of advertising (Taillon et al., 2020). The existing literature indicates that intentions are the first step in developing demand for the desired product; consumers with stronger purchase intentions will increase their purchase behaviour (Wee et al., 2014).

Research also suggested that the online environment could trigger consumers' online purchase intentions and their plans to visit and carry out an in-store purchase (Kang et al., 2018). In terms of marketing by social media influencers, previous work has identified that the influencer endorsement process can act like a high-quality website, providing effective interactions between influencers and followers (Fink et al., 2020).

Unlike general social media marketing, which relies on pictures in posts, live stream influencer marketing can provide a higher quality interaction between the influencer and viewers, which can cultivate a close relationship; in turn, viewers are willing to receive persuasive

messages (Ma et al., 2022). Unlike general live stream marketing, where goods/products are typically purchased online using a website link, in-store live stream marketing differs in that it requires potential consumers to experience and purchase the product or service in-store (offline). In this case, it is extremely important to investigate customers' in-store or offline purchase intentions after they have interacted with in-store live streamers. As mentioned above, purchase intention is a crucial determinant of consumers' actual purchase behaviours. Thus, it is important for the study to consider consumers' in-store or offline purchase intentions. Because purchase intention has been widely used as the 'response' factor in the SOR framework (Zhu et al., 2020), in this study, we included consumers' in-store or offline purchase intentions as the response factor in our SOR model.

2.4. Development of hypotheses

From the literature review presented above, it is clear that environmental stimuli help consumers form different emotional reactions to an object (Ganesh et al., 2010). An attractive online environment can stimulate potential consumers with more interesting online cues and can further positively influence their attitudes (Ganesh et al., 2010). In an in-store live stream context, this research suggests that influencers and their content could engage potential consumers by using different environmental stimuli (informativeness, wishful identification, para-social relationships, and inspiration) that help form their attitudes towards influencers or the advertised products (see Fig. 1). Therefore, we suggest the following hypotheses:

H1a–d. The environmental stimuli from in-store live streaming (a. informativeness; b. wishful identification; c. para-social relationships; d. inspiration) have a direct and positive influence on customers' attitudes towards the live stream influencers.

H2a–d. The environmental stimuli from in-store live streaming (a. informativeness; b. wishful identification; c. para-social relationships; d. inspiration) have a direct and positive influence on customers' attitudes towards the endorsed products.

Past research has demonstrated that consumers' positive attitudes towards online shopping influence their purchase intentions regarding

products that are advertised online (Park and Lin, 2020). Chetioui et al. (2020) identified that consumers' attitudes toward an object can likewise predict their plans to purchase it. As previously discussed, researchers have only considered the relevance of consumers' attitudes and online purchase intentions; to date, no prior studies have investigated in-store or offline purchase intentions. In this study, we suggest that the in-store live stream environment can encourage consumers to engage more with advertising, stimulate their positive attitudes towards products and influencers, and further trigger their in-store or offline purchase intentions. Accordingly, the following hypotheses are proposed:

H3a. Consumers' attitudes towards the in-store live streamers have a direct and positive influence on consumers' intentions to purchase in-store.

H3b. Consumers' attitudes towards the advertised products have a direct and positive influence on consumers' intentions to purchase in-store.

According to the SOR framework, the 'organism' usually mediates the relationship between the stimulus and response (Fu et al., 2021). In this study, we consider that influencers can stimulate consumers' interest in products, assist them to form positive attitudes towards influencers and products, and eventually inspire consumers to have in-store or offline purchase intentions. Therefore, consumers' attitudes can mediate between different source factors (stimuli) and consumer behaviours (response). Thus, we propose that:

H4a-d. Consumers' attitudes towards the in-store live streamers mediate the relationship between environmental stimuli (a. informativeness; b. wishful identification; c. para-social relationships; d. inspiration) and consumers' intentions to purchase in-store.

H5a-d. Consumers' attitudes towards the products mediate the relationship between environmental stimuli (a. informativeness; b. wishful identification; c. para-social relationships; d. inspiration) and consumers' intentions to purchase in-store.
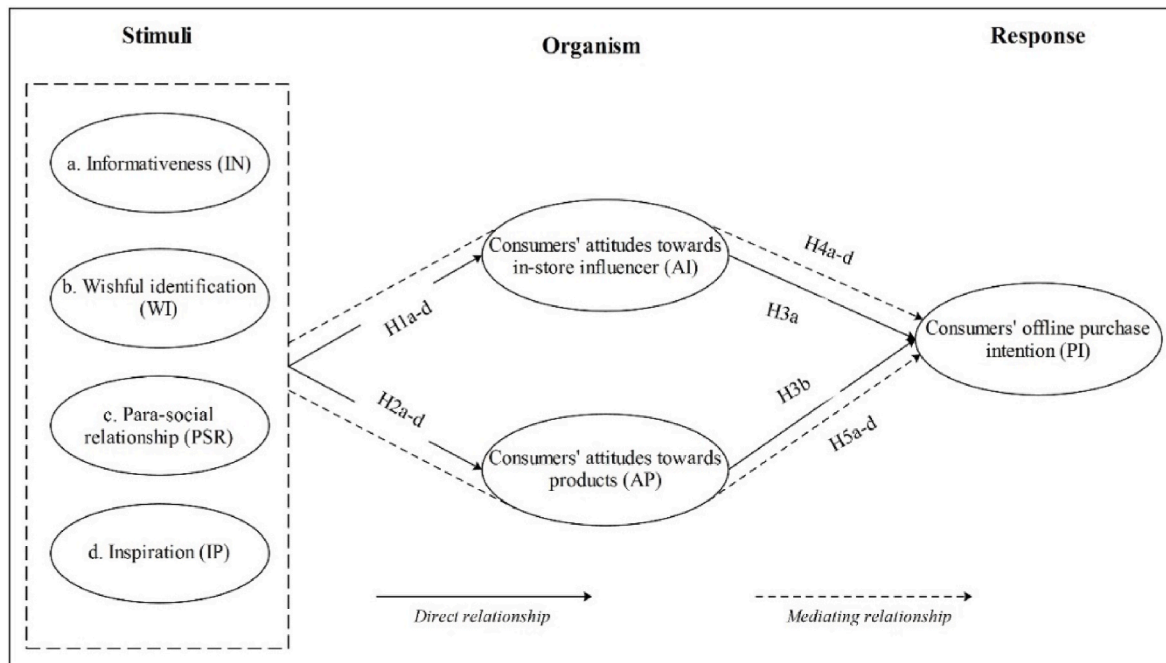

Fig. 1. The conceptual model.

3. Methodology

3.1. Development of survey instruments

A self-administered online questionnaire was developed for this study. In order to make the measurement instruments fit to the in-store live stream context, all the measurement items (see Appendix A) were adapted and modified from previous studies to help address the aim of this study. Fig. 1 shows the conceptual model of this study.

The online questionnaire was initially developed in English. Given that China has more than 433 million live streaming viewers, and live stream influencer marketing has enjoyed huge successes in the Chinese e-commerce field (China Internet Network Information Center, 2019), we decided to collect data in China. According to Keenan (2022), China also accounts for 52.1% of all retail ecommerce sales worldwide, with total online sales just over $2 trillion in 2021.

We therefore translated the questionnaire into a Chinese version. Two qualified bilingual translators then translated the Chinese version of the questionnaire back to English. A pre-test was conducted by a convenient student sample in China. All items in the survey were measured on a seven-point Likert scale (1: strongly disagree, to 7: strongly agree).

3.2. Sample and data collection

The individuals who had interacted with an in-store live stream are counted as the population unit for this research. As the population size is large and their behavioural pattern is unknown, this study estimated the sample size using the best-fit Slovin's formula ($n = N/(1 + Ne^2)$, n = sample size, N = population size , and e = marginal error decided by the researchers; we considered a 7% error). Given this, the suggested sample size was 204.

A Chinese professional survey company (https://wj.qq.com/) was tasked with distributing the questionnaire to the target population and collecting the data. With the aim of collecting as much data as possible while satisfying the requirements of the study at the same time, this study used both random and convenient sampling methods. A prerequisite for a respondent to be eligible for participation in the research was that they had previous experience watching in-store live streams. Participants were asked initial questions about their eligibility and willingness to participate: Do you have experience watching in-store live streams? This is an academic study that is voluntary; would you be happy to participate in this study? There were two options for the answer: a) Yes b) No. Respondents who answered "No" were excluded from the main survey. It is worth noting again that, before starting the main survey, we pre-tested the questionnaire on 20 individuals with different backgrounds to ensure that the respondents could understand the questions. Unclear questions were modified. The final data consists of a total of 234 samples, which is more than our required sample number. Only one response was permitted from each individual respondent to exclude any possibility of sample bias. A restriction placed on the recruitment of participants was that they must be over 18 years of age.

3.3. Analytical approaches

This research makes use of both exploratory and confirmatory factor analyses. Under exploratory factor analysis (EFA), we have tested for normality, sample adequacy, and common method bias, as well as examined demographic data and the identity of the model's correlation matrix. Structural equation modelling (SEM) was adopted for data analysis as part of confirmatory factor analysis (CFA). The conceptual model was tested using Smart-PLS (v. 3.3.9), which is a method suitable for using small sample sizes to analyse complex models, such as when exploring the moderator and mediator effects in business and marketing (Carlson et al., 2016). For EFA, we used SPSS (v. 23) software.

4. Analysis and results

4.1. Demographic information

Appendix B summarises the demographic information of the participants of this study. Among the 234 respondents, 58.1% were female, 41.6% were male, and 0.4% were non-binary. The majority of participants were young adults, with the largest age group falling between the ages of 18 and 25 (43.2%), followed by those aged between 26 and 35 years (38.5%). It is worth mentioning that 53.4% of respondents were currently engaged in full-time employment; the next largest cohort was students, at 33.8%. Only 6% of respondents were unemployed at the time of the survey. Most participants (56%) had completed an undergraduate degree. Despite this, a significant proportion of respondents (41%) had an income of less than RMB 50,000 per annum. The most popular in-store live stream marketing platforms among the surveyed sample were Tik-Tok (China, ◆◆) (78.6%), followed by Little Red Book (51.3%).

4.2. Exploratory factor analysis (EFA)

The Kaiser-Meyer-Olkin (KMO) test was used to evaluate how well-suited the data is for factor analysis by measuring the sample adequacy for each variable in the model. At the same time, Bartlett's test of sphericity was applied to check if the correlation matrix is indeed an identity. KMO scores may be calculated for both the overall correlation matrix as well as for each individual variable measured. These values can vary from 0.00 to 1.00. Overall, KMO values ≥ 0 0.70 are desirable. Table 1 reveals that the KMO score for EFA of the items is 0.929, indicating a sufficient sample size for CFA, and Bartlett's test of sphericity is significant at p = 0.000, which is less than 0.05. This shows that the correlation matrix for the model's constructs is not an identity matrix.

The univariate normality of each item was analysed using a method that included skewness and kurtosis (Byrne, 2013; Hasan and Bao, 2020). The findings showed promising application on their respective scales. As can be seen in Appendix C, the skewness values ranged from −2 to +2, and the kurtosis values ranged from −7 to +7, which provided evidence for the normality of the univariate distribution (Byrne, 2013).

In terms of common method bias, Harman's single-factor method was applied in this study (Podsakoff et al., 2003). The seven factors were combined into one factor. This study concluded that a single factor was responsible for 45.46% of the variation. Considering that this figure was far lower than the recommended threshold of 50% (Podsakoff et al., 2003), the common method bias is not a significant threat to the study.

4.3. Reliability and validity

Following Henseler et al. (2015), the standardised root mean square residual (SRMR) was used to validate the model. It is suggested that the value of the SRMR needs to be less than or equal to 0.09 (Henseler et al., 2015). With an SRMR of 0.086, our model provided a very good fit for the data. Cronbach's α and composite reliability (CR) can assess the constructs' reliability. In this study, the range of Cronbach's α for each of the seven constructs is from 0.753 to 0.873, indicating that these constructs have strong reliability.

Moreover, past studies suggested that a model can show excellent convergent validity if it meets the following criteria: CR should be larger than or equal to 0.7; the average variance extracted (AVE) should be at

Table 1
KMO and Bartlett's test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.929
Bartlett's Test of Sphericity	Approx. Chi-Square	5517.161
	df	780
	Sig.	**0.000**

least 0.5, and the item loading for each construct should be larger than 0.707 (Chin, 2010). As shown in Table 2, the CR of all constructs was greater than 0.7; the AVE of the constructs ranged from 0.566 to 0.725, and the item loading of each construct (see Appendix C) was larger than 0.707 except AI3 (0.667), which indicated a good convergent validity.

The discriminant validity was tested using the square root of the AVE and the cross-loading matrix (Fornell and Larcker, 1981). In this study, the square root of the AVE of each construct was larger than the correlation with other constructs, as shown in Table 3, which indicates that the discriminant validity was met for this study.

Finally, this study estimated a new method for each pair of factors; this method was called the Heterotrait–Monotrait ratio (HTMT) criterion, and it allowed us to ensure that the discriminant validity was performed using a double-blind design. Taking the criteria of HTMT 0.90 or HTMT inference (Henseler et al., 2015) into account, the factors verified the discriminant validity (see Table 4).

4.4. Conceptual model testing

We used two measures to identify the relationship between dependent and independent variables: the test of hypothesised effects (T-statistics) and the amount of variance that could be explained by the model (R^2). The T-statistics revealed the statistical significance of the estimated path coefficients (β) at a certain level (Hair et al., 2012). In this study, we used a bootstrapping method and followed the rule proposed by Martinez-Ruiz and Aluja-Banet (2009); i.e., the T-value larger than 1.96 is significant at the level of 0.05 (p < 0.05). Moreover, the results of R^2 can measure the amount of explained variance of the dependent variable in its model. According to Chin (2010), if R^2 is above 0.35, it will be considered substantial; if the value is around 0.33, it will be considered moderate; if it is below 0.19, it is considered a weak R^2.

The results of our analysis are shown in Table 5. They indicate that the environmental stimuli (a. Informativeness; b. Wishful identification; c. Para-social relationships; d. inspiration) are statistically significant in explaining consumers' attitudes towards the live stream influencers and products, which support H1a–d and H2a–d. Then, consumers' attitudes towards the live stream influencers and products were also found to positively influence consumers' intentions to purchase in-store in the live stream influencer marketing context, which support H3a–b. Finally, we examined the mediating effect of consumers' attitudes towards the influencers and products, and found that both H4a–d and H5a–d were supported (Table 6). The results showed that consumers' attitudes towards the influencers and products could mediate the relationship between environmental stimuli (WI, PSR, IN and IP) and consumers' in-store or offline purchase intentions.

However, it is worth emphasising that the direction and significance of the particular path coefficients cannot be compiled and examined, even in the absence of probability values. Thus, the next steps were to estimate the model variance. Regarding R^2, the model indicated that 56.9% of variance lay in consumers' attitudes towards the products (AP), 58.6% of variance emerged from consumers' attitudes towards the influencers (AI) and 74.7% of variance resulted from consumer's intentions to purchase in-store. The value of R^2 in this model met the requirements of substantial R^2. Fig. 2 shows the results of the model test.

Table 2
Construct reliability and convergent validity.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
AI	0.794	0.806	0.867	0.621
AP	0.873	0.874	0.913	0.725
IN	0.808	0.809	0.867	0.566
IP	0.778	0.786	0.871	0.692
PI	0.790	0.792	0.878	0.706
PSR	0.762	0.767	0.847	0.582
WI	0.753	0.751	0.861	0.676

Table 3
Discriminant validity (Fornell-Larcker Criterion).

	AI	AP	IN	IP	PI	PSR	WI
AI	**0.788**						
AP	0.787	**0.851**					
IN	0.680	0.663	**0.752**				
IP	0.557	0.614	0.619	**0.832**			
PI	0.773	0.847	0.644	0.604	**0.840**		
PSR	0.659	0.652	0.711	0.558	0.666	**0.763**	
WI	0.653	0.593	0.599	0.458	0.609	0.664	**0.822**

Table 4
Discriminant validity (HTMT Criterion).

	AI	AP	IN	IP	PI	PSR	WI
AI							
AP	0.943						
IN	0.849	0.786					
IP	0.707	0.739	0.776				
PI	0.970	1.020	0.802	0.768			
PSR	0.835	0.785	0.888	0.704	0.844		
WI	0.826	0.728	0.761	0.589	0.784	0.880	

Next, the Q-square (Q^2) analysis was employed to evaluate the predictive relevance of the model. The Q^2 values that are larger than zero suggest a good relevance to the prediction (Rehman Khan and Yu, 2021). Table 5 shows that the conceptual model achieved $Q^2 = 0.383$, $Q^2 = 0.338$ and $Q^2 = 0.496$ for AP, AI and PI, respectively, which suggests a good fit. Finally, this study evaluated the effect size (f^2) to understand the impact of an individual predictor on the model. According to Cohen (1988), f^2 values of 0.02, 0.015 and 0.35 refer to small, medium and large effects, respectively. As illustrated in Table 5, the results indicate that IN, WI, PSR and IP had small effects on AI and AP. Similarly, AI had only a minor influence on PI. However, AP had a large effect on PI.

4.5. Importance performance map analysis (IPMA)

As a further step after the structural model assessment, the novel method of IPMA was used in this study to investigate consumers' intentions to purchase in-store. IPMA is beneficial because it produces extra outcomes and conclusions by integrating the evaluation of the importance and performance aspects in practical PLS-SEM applications (Ringle and Sarstedt, 2016). The intention of IPMA is to identify the more important construct that has an effect, despite having a lower average score. According to Table 7 and Fig. 3, the attitudes of consumers towards products were of great importance (0.680), but their performance was poorer (63.518) than that of other predictors. Thus, in-store live streamers, influencers and marketers should focus their attention on customers' attitudes towards the products to boost consumers' in-store or offline purchase intentions.

5. Discussion

Empirical studies of live stream influencer marketing have focused on consumers' intentions to adopt products or services online. However, there is no prior research investigating consumers' in-store or offline purchase intentions. For example, how can an in-store 'eat-out' live stream motivate the audience to visit the restaurant in person? To address this issue, the SOR framework was applied in this study to investigate consumers' intentions to purchase in-store by identifying the environmental stimuli, organism, and response. We considered para-social relationships, inspiration, informativeness and wishful identification as the environmental stimuli that may affect consumers' attitudes towards influencers and products (the organism), and further influence their in-store or offline purchase intention (the response).

Table 5

Hypothesis testing, predictive relevance and effect size estimation of consumers' in-store or offline purchase intentions.

Hypothesis	Relationship	β	T Statistics	P Values	Supported	2.5% CI	97.5% CI	VIF	f^2	R^2	Q^2
H1a	IN - > AI	0.287	4.245	0.000	*Yes*	0.157	0.427	2.466	0.081	AI = 0.586, AP = 0.569,	AI = 0.338, AP = 0.383,
H1b	WI - > AI	0.298	5.502	0.000	*Yes*	0.192	0.404	1.906	0.112	**PI = 0.747**	**PI = 0.496**
H1c	PSR - > AI	0.176	2.491	0.013	*Yes*	0.020	0.304	2.538	0.030		
H1d	IP - > AI	0.144	2.322	0.021	*Yes*	0.027	0.266	1.703	0.029		
H2a	IN - > AP	0.236	3.022	0.003	*Yes*	0.085	0.377	2.466	0.052		
H2b	WI - > AP	0.192	3.321	0.001	*Yes*	0.064	0.300	1.906	0.045		
H2c	PSR - > AP	0.210	2.734	0.006	*Yes*	0.061	0.361	2.538	0.040		
H2d	IP - > AP	0.263	3.877	0.000	*Yes*	0.122	0.381	1.703	0.094		
H3a	AI - > PI	0.279	5.134	0.000	*Yes*	0.186	0.383	2.632	0.117		
H3b	AP - > PI	0.627	11.503	0.000	*Yes*	0.516	0.730	2.632	0.592		

Table 6

Mediation effect of AI and AP in relation to predictors and PI.

Hypothesis	Relationship	β	T Statistics	P Values	Supported	2.5% CI	97.5% CI
H4a	**IN - > AI - > PI**	0.080	3.143	**0.002**	*Yes*	0.034	0.137
H4b	**WI - > AI - > PI**	0.083	3.829	**0.000**	*Yes*	0.045	0.127
H4c	**PSR - > AI - > PI**	0.049	2.194	**0.029**	*Yes*	0.007	0.094
H4d	**IP - > AI - > PI**	0.040	2.076	**0.038**	*Yes*	0.009	0.083
H5a	**IN - > AP - > PI**	0.148	2.982	**0.003**	*Yes*	0.059	0.259
H5b	**WI - > AP - > PI**	0.120	3.183	**0.002**	*Yes*	0.041	0.197
H5c	**PSR - > AP - > PI**	0.132	2.557	**0.011**	*Yes*	0.035	0.236
H5d	**IP - > AP - > PI**	0.165	3.555	**0.000**	*Yes*	0.075	0.253
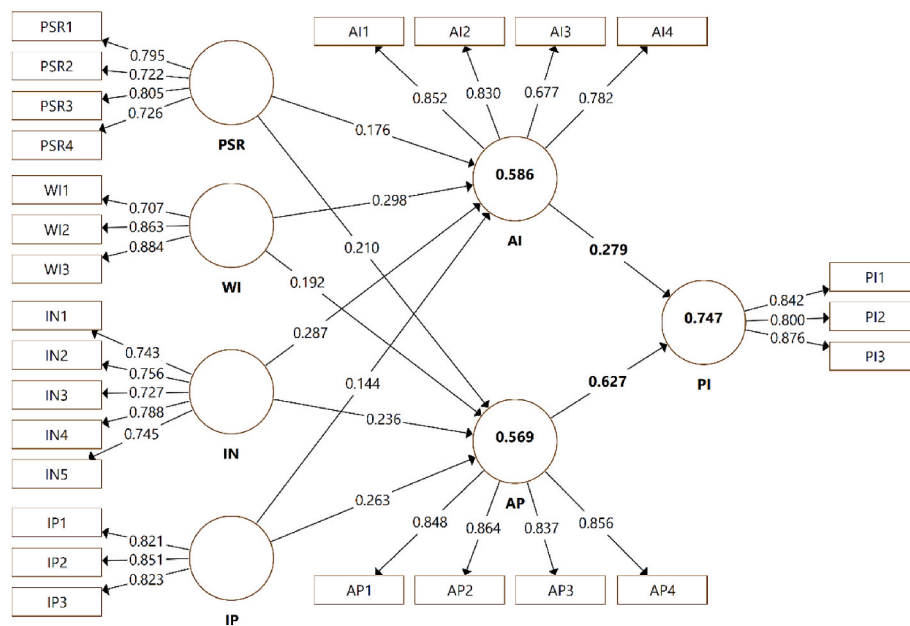
Fig. 2. Path diagram.

Table 7

IPMA results.

	Importance	Performance
Consumers' attitudes towards influencers	0.309	64.871
Consumers' attitudes toward products	0.680	63.518
Informativeness	0.265	66.533
Inspiration	0.228	69.703
Para-social relationship	0.181	63.135
Wishful identification	0.171	57.365

The study produced three findings. First, H1a–d and H2a–d were supported. This is consistent with previous studies (Gao and Koufaris, 2006). Furthermore, the results indicate not only that live stream marketing can combine features from offline and online marketing techniques, but also that environmental stimuli could positively affect consumers' emotional responses (attitudes). Second, H3a–b were supported. The findings indicate that consumers' attitudes are crucial to their in-store or offline purchase intentions. Finally, H4a–d and H5a–d were supported, demonstrating that consumers' attitudes can mediate the relationship between environmental stimuli and consumers' in-store or offline purchase intentions.
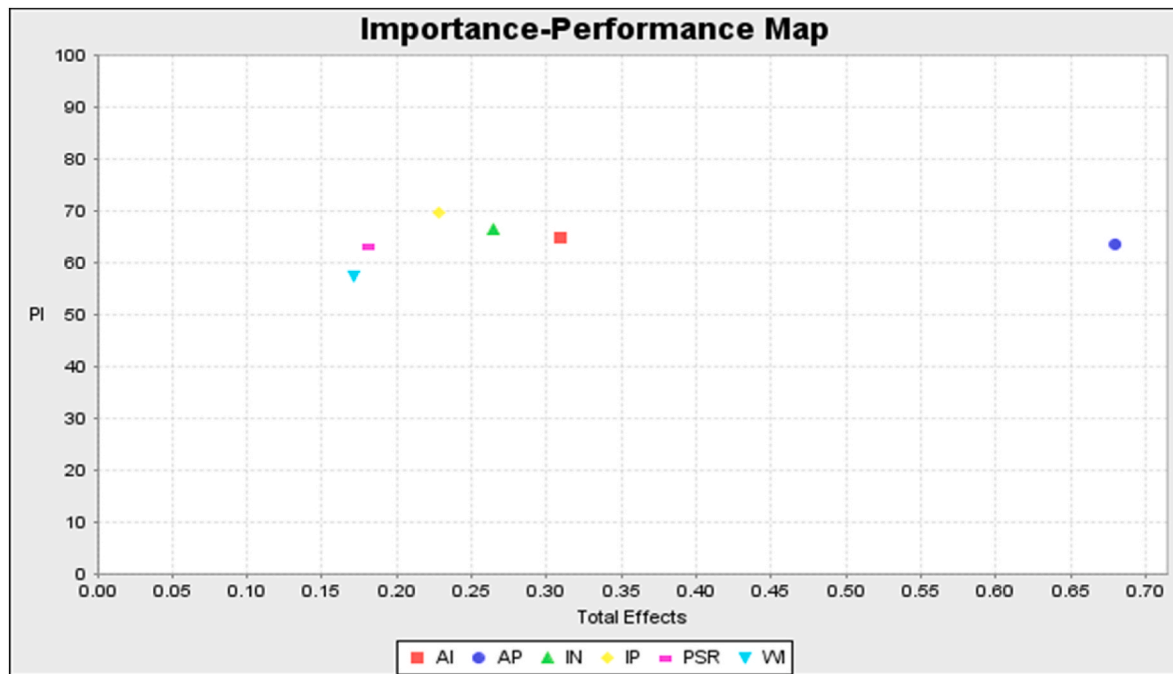
Fig. 3. Importance-performance plots.

5.1. Theoretical implications

Despite the fact that live stream marketing has a lot of potential to stimulate fast sales, little is known about the possible explanations for consumers' offline or in-store purchase intentions after viewing an in-store live stream. Prior live stream marketing research has primarily focused on consumers' online purchasing behaviour (Hu and Chaudhry, 2020; Wongkitrungrueng and Assarut, 2018; Wongkitrungrueng et al., 2020). This study contributes to the growing body of knowledge on live streaming by shedding light on consumers' in-store purchase intentions within the context of a new kind of cognitive purchase strategy (in-store) enabled by live streaming, which has been overlooked by prior studies.

Additionally, this study investigated different environmental stimuli (WI, PSR, IN, and IP) that had not been studied in the context of in-store live stream. Since in-store live streaming is a relatively new marketing channel for both researchers and marketers, the factors investigated in this study could provide a basis for further improvements to marketing strategies. This creates a new direction for researchers seeking to analyse consumer behaviour related to offline purchasing after watching in-store live streams, and addresses a gap in the live stream marketing literature (Hu and Chaudhry, 2020; Lin et al., 2022; Ma et al., 2022; Wongkitrungrueng and Assarut, 2018). Moreover, this study offers an analytical viewpoint and insights for the potential interactions in live stream marketing by broadening the usage of the SOR model into this area. By providing empirical data in the in-store live stream marketing sector in the context of followers' attitudes about products and influencers integrating the SOR model, this study broadens the applicability of the SOR model in this context.

Furthermore, this study offers a novel avenue for the social media communities (or followers) and online celebrities, as both technological affordances and emotional engagement (the organism) have been studied. Specifically, the study has shown that consumer attitudes mediate the relationship between environmental stimuli and in-store or offline purchase intentions. The results of this study highlight the importance of consumers' attitudes towards influencers and products, and should be further investigated in future social media marketing research that supports similar findings (Belanche et al., 2021a; Park and Lin, 2020). The study reveals how a consumer's attitude towards the in-store live streamer and products affects the likelihood that they will make an offline purchase, reflecting the importance of consumers' attitudes in digital marketing.

5.2. Practical implications

The following are some managerial implications of this research. First, the environmental stimuli presented in this study could be widely applied to various products or services using in-store live stream marketing. The results of this study indicate that the environmental stimuli (such as wishful identification, para-social relationships, informativeness and inspiration) positively affect consumers' attitudes towards the influencers and products; this can, in turn, positively influence the consumers' intentions to make offline purchases in an in-store live stream marketing context. It is therefore important that influencers create a friendly atmosphere for online interation to generate a higher level of para-social relationship between themselves and their audience. For example, in terms of wishful identification, live streamers should first understand the personal characteristics of their followers, and then incorporate those characteristics or personalities in their live stream strategies to demonstrate a degree of commonality, which can stimulate credibility and trustworthiness. Furthermore, live streaming represents a great platform to provide followers with comprehensive information. Creative marketing content is an excellent medium to inspire and motivate potential customers, with timeliness and accuracy being two of the most important attributes. Our results also show that it is vital for in-store live streamers to deliver their promises and strive to inspire their followers.

Second, this study provides rigorous methodical guidelines for making in-store purchases successful by applying IPMA. IPMA makes it possible to pinpoint an area that could benefit from putting additional emphasis for enhancing the existing level of performance (Rokonuzzaman et al., 2020). Despite not performing as well compared with informativeness, wishful identification, para-social relationship and inspiration, our innovative IPMA evaluation revealed that customers' attitudes towards products (AP) have the greatest impact on in-store purchase intention. Therefore, live streamers, influencers and marketers should place more focus on the attitudes of customers towards

products (AP) to improve the consumers' intentions (PI) to buy in-store. It is also vital that retailers, live streamers and marketers offer adequate information about a product, present all aspects of the product, properly respond to customers' inquiries, and focus on product quality assurance and after sales services.

Third, while previous studies have mostly focused on investigating the impact of consumers' participation in online/live stream shopping experiences (Hu and Chaudhry, 2020; Ma et al., 2022; Wongkitrungrueng et al., 2020), this study suggested that consumers' attitudes towards influencers (AI) represent a crucial indicator of their intentions to purchase in-store. Thus, unlike static image marketing, live streamers (influencers) can use vivid cyber languages to demonstrate their inspiration, expertise, and credibility to the audience. Our empirical research confirmed that the four environmental stimuli (IN, WI, PSR, and IP) influence consumers' attitudes towards influencers in the context of in-store live streaming. Marketers and live stream influencers should use this knowledge to predict consumer behaviour, which may improve the effectiveness of live stream marketing. Therefore, the conceptual model developed in this study can benefit both marketers and live streamers involved in the practice of live stream marketing for improving in-store or offline purchase intentions.

6. Conclusion, limitations and future research

The main objectives of this study were (1) to examine what factors in stimuli will affect the organism (consumer attitudes), (2) to explore consumers' in-store or offline purchase intentions, and (3) to test the mediating effect of the organism (consumer attitudes) on the relationship between different stimuli and consumers' response (in-store or offline purchase intention). This study used the SOR model and PLS-SEM analytical technique to assess the research hypotheses and answer the research questions. According to our findings (path analysis, IPMA, predictive relevance, and effect size), the consumer AP has a notable impact on in-store or offline PI.

While this research has contributed to the growing body of

knowledge on live stream marketing, and in-store live streams in particular, it does have some limitations that need to be addressed for future research. First, this research was conducted in China and, thus, does not consider the effects of different national contexts and government policies on live stream marketing. It will be necessary and important for future research to consider and compare in-store live stream marketing against different cultural backgrounds. Second, this research examined general in-store products or services in the context of live stream marketing. However, live stream marketing could have varying effects for different products: for example, an eat-out live stream focused on a restaurant may differ from a shopping tour live stream. The different types of live streams may involve different target audience members and marketing strategies. Therefore, future research should consider live stream influencer marketing across various products in all their specificity.

Research involving human participants

Approval was obtained from the ethics committee of The University of Newcastle, Australia (H-2021-0273).

Informed consent

Informed consent was obtained from all individual participants included in the study.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Different constructs' items with sources

Constucts	Items	Sources
Informativeness	IN1-Information provided by the in-store live streamer is beneficial. IN2–I think the in-store live streamer provides timely information about the product or service. IN3-The in-store live stream supplies relevant product or service information. IN4-I found that watching the in-store live stream is a convenient source of getting the product or service information. IN5-The in-store live stream always provides complete product information.	Logan et al. (2012)
Wishful identification	WI1- The in-store live streamer is the person I want to be like myself. WI2–I wish I could be more like the in-store live streamer.	Shoenberger and Kim (2019)
Para-social relationship	PSR1-I look forward to watching the in-store live streamer on her/his channel. PSR2-When I watch a certain in-store live stream, I feel like I am part of the streamer's group. PSR3-The in-store live streamer makes me feel relax and comfortable as if I am with friends. PSR4-When the in-store live streamer expresses his/her feeling about a certain product or service, it helps me make up my mind about that product or service.	Reinikainen et al. (2020)
Inspiration	IP1–In-store live streaming represented the products/services in an appealing way. IP2–In-store live streaming helps me to be imaginative about the products/services. IP3–In-store live streaming inspired me to visit the physical store/service providers.	Cheng et al. (2020)
Consumers' attitudes towards influencers	AI1-I consider that the in-store live streamer serves as a reliable source of information and discovery. AI2-I believe that the in-store live streamer presents interesting content. AI3-I think the in-store live streamer serves as a reliable source for me.	Chetioui et al. (2020)
Consumers' attitudes towards products	AP1-I have a favourable opinion about the product or service that the in-store live streamer recommended. AP2-I think the product or service that the in-store live streamer recommended is interesting. AP3-I think the product or service that the in-store live streamer recommended is likable. AP4-I think the product or service that the in-store live streamer recommended is pleasant.	Belanche et al. (2021b)
Consumers' in-store purchase intentions	PI1–I feel the product/service that the live streamer recommended is worth buying in-store. PI2–I want to try the product that the live streamer recommended during live streaming in-store. PI3–I am willing to recommend the product or service that the live streamer advertised to my friends and family.	Park and Lin (2020)

Appendix B. Demographics information

Characteristics	Items	Quantity	Percentage
Gender	Male	97	41.6%
	Female	136	58.1%
	Unisex	1	0.4%
Occupation	Student	79	33.8%
	Full-time	125	53.4%
	Part-time	25	10.7%
	Unemployed	14	6%
	Prefer not to say	1	0.4%
Age range	18–25	101	43.2%
	26–35	90	38.5%
	36–45	27	11.5%
	46–55	7	3%
	56–65	4	1.7%
	66–70	0	0%
	70+	1	0.4%
	Prefer not to say	4	1.7%
Education level	Primary School	1	0.4%
	Middle School	11	4.7%
	High School	48	20.5%
	Undergraduate	131	56%
	Master	30	12.8%
	PhD	5	2.1%
	Prefer not to say	8	3.4%
Annual income level	Less than 50 K RMB	96	41%
	51 K–100 K RMB	63	26.9%
	101 K–151 K RMB	33	14.1%
	151 K–200 K RMB	16	6.8%
	Above 200 K RMB	13	5.6%
	Prefer not to say	13	5.6%
Live stream platform used for watching	Tik-Tok	184	78.6%
	Yizhibo	14	6%
	Douyu	34	14.5%
	Little Red Book	120	51.3%
	Others	31	13.2%

Appendix C. Weights and loadings of the measure of development outcomes with normality and colliniarity testing

	Outer Loadings	SD	Kurtosis	Skewness	T Statistics	P Value	2.5%CI	97.5% CI	VIF
AI1	0.852	1.237	0.18	−0.411	41.198	0.000	0.805	0.885	1.970
AI2	0.830	1.165	0.296	−0.339	30.341	0.000	0.768	0.875	1.848
AI3	0.677	1.163	−0.393	−0.217	11.982	0.000	0.533	0.763	1.407
AI4	0.782	1.293	0.177	−0.296	20.600	0.000	0.680	0.839	1.637
AP1	0.848	1.217	0.092	−0.281	35.714	0.000	0.791	0.888	2.162
AP2	0.864	1.125	0.01	−0.331	41.734	0.000	0.815	0.897	2.359
AP3	0.837	1.13	0.235	−0.21	31.370	0.000	0.769	0.881	2.041
AP4	0.856	1.153	0.088	−0.236	44.220	0.000	0.812	0.889	2.304
IN1	0.743	1.242	−0.325	−0.156	19.274	0.000	0.656	0.802	1.573
IN2	0.756	1.12	−0.246	−0.247	20.931	0.000	0.672	0.814	1.673
IN3	0.727	1.188	1.067	−0.886	20.930	0.000	0.647	0.783	1.561
IN4	0.788	1.222	0.382	−0.575	28.843	0.000	0.726	0.833	1.848
IN5	0.745	1.348	−0.152	−0.435	21.608	0.000	0.665	0.799	1.560
IP1	0.821	1.116	1.055	−0.748	29.704	0.000	0.759	0.863	1.666
IP2	0.851	1.171	1.144	−0.753	37.790	0.000	0.796	0.884	1.611
IP3	0.823	1.168	−0.299	−0.353	29.755	0.000	0.764	0.869	1.559
PI1	0.842	1.179	0.268	−0.231	33.602	0.000	0.789	0.885	1.777
PI2	0.800	1.308	0.766	−0.766	26.733	0.000	0.736	0.853	1.488
PI3	0.876	1.325	−0.136	−0.276	52.687	0.000	0.838	0.903	1.954
PSR1	0.795	1.393	0.316	−0.628	26.600	0.000	0.727	0.844	1.564
PSR2	0.722	1.702	−0.816	−0.067	16.557	0.000	0.625	0.795	1.679
PSR3	0.805	1.471	−0.386	−0.319	26.540	0.000	0.735	0.852	1.871
PSR4	0.726	1.183	0.61	−0.705	18.035	0.000	0.627	0.788	1.325
WI1	0.707	1.3	0.052	−0.544	17.066	0.000	0.609	0.772	1.171
WI2	0.863	1.707	−0.862	−0.024	31.292	0.000	0.792	0.903	2.784
WI3	0.884	1.748	−0.871	−0.065	46.835	0.000	0.841	0.915	2.887

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