

How can live streamers enhance viewer engagement in eCommerce streaming?

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Abstract

eCommerce live streaming has enabled new forms of customer engagement, where live streamers, viewers and platform owners engage each other in real time to hawk and trade goods and services. Central to live streaming sales are live streamers. It is therefore critical to discover techniques to maximize live streamers' engagement with viewers. Based on the intimacy theory, we propose the perceived intimacy live streamers created improves online engagement with viewers. Our survey results suggest streamers' authenticity, attitudinal similarity and customer response capability enhance intimacy perceived by online viewers, leading to viewers' online engagement. Contributions of our study are discussed.

Keywords: Live stream shopping, intimacy, authenticity, attitudinal similarity, customer response capability, online engagement.

1. Introduction

Live stream shopping is one new way of advertising and selling products [1]. It is carried out in real time and highly interactive. Streamers show off the products they are selling with product discounts and statistics flashing across their customers' screens, and the customers may ask real-time questions about pricing, shipping, and product functionality etc. during live broadcast. Live stream shopping offers customers with pseudo in-store shopping experiences in the comfort of their own homes. When customers are ready to purchase, they click on an embedded link provided in the video and then check out. Live stream shopping works. In 2018, Taobao, one of the largest e-commerce companies in the world, sold USD\$14.93 billion of merchandise through live streaming [2]. The live streamer, Viya, attracted over 12 million views and sold 15,000 bottles of Kim Kardashian West's perfume in just a few minutes [3]. Live stream shopping is especially effective on the millennium generation (i.e., consumers born between 1982 and 2000) [4, 5], who are comfortable using social media to search for new products [5]. Certain brands (e.g., Huaxizi, LittleOndine) use live stream shopping as their main marketing channel [6].

Live streamers are critical to the success of live stream shopping as they bridge brands and consumers. Beyond hawking products, live streamers demonstrate how products are used, and answer consumers' questions in real time [7]. In other words, unlike traditional forms of marketing, live streaming combines elements of discovery, sales and after sales.

One of the key metrics that live streamers aim to maximize is online viewer engagement. In many ways, online viewer engagement is as important as live streaming sales. While Viya sold 15,000 bottles of perfume, it was more important that she also influenced 12 million potential customers to buy the perfume in the future and generated a tremendous volume of word-of-mouth and viewer engagement for the perfume. Real-time online engagement involves dynamic interactions and continuous conversations between streamers and their viewers [8, 9]. Although studies have been conducted on online engagement [10], how to maximize real-time online engagement in e-commerce streaming remains understudied.

It is widely observed in mass media research that viewers tend to develop a kind of psychological relationship in which they consider media personalities as their friends, regardless of their limited interactions with those media personalities [11]. Media figures' attributes, behaviors and responses thus can help promote viewers' attachment to the media figures to maximize their online viewership [12]. The intimacy theory suggests intimacy or attachment results from a process that is initiated when one person (i.e., the live streamer) communicates authentic and personally relevant information (that revealing the core self) to another person (i.e., the viewer) [13, 14]. To test this, we performed a survey on 537 Chinese online shoppers. Our results demonstrate live streamers, who are able to create authentic customer experiences (customers feeling understood), respond to viewers in a timely and professional fashion (customers feeling cared for), and share similar attitudes with their viewers (customers feeling approved of), will enhance viewers' perceived intimacy, ultimately leading to their online engagement.

This study contributes to the literature in the following ways. First, we provide new theoretical insights for online engagement by extending the application of the intimacy theory to the live streaming

shopping context. Second, this study provides practical guidelines for live streamers and brands to increase their online engagement with their viewers by facilitating intimacy perception.

2. Literature reviews

Live stream shopping is a new way to advertise products. In live stream shopping, streamers hawk one or more products in real time to viewers [15, 16]. Modern technology provides a number of affordances to live stream shopping other marketing channels do not. For example, during a live stream, streamers can provide hyperlinks. They or their background team can also send private messages to particular viewers to clarify confusion or address problems. Likewise, viewers can raise questions or respond to other viewers' comments on a real-time basis. Thus, while live stream shopping is facilitated by a live streamer, communication is actually taken place in multiway among the product owner, streamer, and viewers [17]. The interactive real-time nature of live stream shopping has been demonstrated to reduce the audience's lack of perceived control [18, 19], and improve their consumption experiences and acceptance of branded products/services [20]. Increasing research demonstrates that live streaming enables an immersive experience and interpersonal connection even without any actual human contact [21, 22].

2.1. Online engagement

Online communities has been found to be a successful tool for increasing sales and profitability [23, 24]. With the change in the dynamics of marketing introduced by social networks, a broader focus on existing and prospective customers and their non-transactional behaviors in the online communities, such as engagement, has become increasingly important [25]. Online engagement can result in a greater volume of word-of-mouth, an improved attitude towards the brand, or more consumer involvement in the design process [25, 26]. Thus, understanding the influencing factors of online engagement is a worthy goal to pursue.

Online engagement refers to viewer interactions with a brand or streaming media through an online media platform [27]. It typically reflects in three subdimensions: behavioral engagement, affective engagement and cognitive engagement [25, 27-31].

Behavioral engagement refers to behaviors beyond purchase that result from intrinsic motivational drivers. 'Behavioral engagement' is a series of interactive behaviors produced by viewers (e.g., seeking or sharing information about a live streamer's personal brand).

Affective engagement refers to a viewer's emotional attachment to a streamer and his/her streams. For example, viewers derive pleasure or happiness from interactions with streamers.

Cognitive engagement refers to a set of enduring and active mental states that viewers experience. Cognitive engagement focuses on viewers' mental activities, involving viewers' consciously paying attention to streamers' live streams, or showing concern to live streamers or other users in the interaction process.

2.2. Perceived online intimacy

Most live streamers are eager to improve their online engagement. But how to do so remains an unsolved question. To answer this question, we turn to the intimacy theory [13, 14].

Intimacy is an essential aspect of many interpersonal relationships, such as parents-children, married couples, friends, or patients-psychotherapists [13, 14]. The Internet provides a new channel for humans to experience and realize intimacy (e.g., online dating) [32]. It has been found that the Internet can help maintain relationships and promote online intimacy [33]. Traditionally, an intimate relationship refers to the establishment of private and close feelings with someone through a series of sustained and reciprocal interpersonal interactions (e.g., via physical proximity and direct face-to-face contacts) [34-36]. It has been found that the way that intimacy is established (i.e., online vs. offline) does not affect the nature of perceived intimacy that gratifies human needs for social exchanges [34].

Media figures can promote an illusion of intimacy with their audience through a constant gaze into the camera lens, resembling actual interpersonal interactions [37]. Viewers thus can come to feel that they know the figures as they do their friends and neighbors [38]. We call it an illusion because the perceived intimacy is one-sided. The intimacy literature suggests many factors can potentially create viewers' perceived intimacy, including media figures' attributes or attitudes, conversational styles (e.g., authentic, casual), or responsive behaviors that can make viewers feel understood, approved of or cared for [13, 14]. As a result, viewers may make attempts to contact with or engage in imagined or affective interactions with the media figures.

While live stream shopping is a form of hawking products by way of multiway interactions among product owners, live streamers, and their viewers, viewers often perceive it as a private two-way interaction between themselves and the live streamer. This is because visually, the only human the viewer perceives is the live streamer. There is no visually depicted live studio audience or audio cue from

conversations with other viewers. Communication from other viewers appears as text messages in a sidebar, which is no different from how regular text messages from unrelated individuals will appear while one is having a private videoconference.

Thus, streamers can adopt some strategies or take advantage of their own attributes to create intimacy with individual viewers who may only have limited interactions with particular streamers. In a live stream, streamers can make viewers feel like the streamers are speaking directly to certain individual viewers (e.g., via responding quickly to their comments) or demonstrate attitudes towards certain topics similar to their viewers (e.g., top priority for product quality). In return, these viewers will likely feel that they are cared for and their attitudes are approved of by the streamers, and, as a result, they will be more willing to engage in more interactions with the streamers and other viewers.

Even though the intimacy perceived by the audience is an illusion, viewers regard the streamers as reliable friends and are willing to spend time watching their live streams [11]. In addition, the emotional closeness with the live streamers can create prejudice (in a positive sense) towards the streamers, so viewers tend to evaluate the streamers and the products/services they recommend in a positive light, leading to their willingness to pay attention to what the streamers try to convey. We thus hypothesize:

H1: Viewers' perceived online intimacy is positively correlated with their online engagement.

Viewers' perceived intimate relationships and online engagement during a live stream are influenced by many factors. According to the intimacy theory [13, 14], viewers are more likely to perceive intimacy if they perceive a live streamer to be *understanding* (accurately capturing the viewers' needs and situations), *validating* (confirming the viewers are valued), and *caring* (showing concern for the viewers) [13]. We therefore argue three factors will significantly influence viewers' perceived online intimacy. First, Chinese consumers have been constantly plagued by counterfeit goods and mistrust towards merchants [39]. The authenticity of the streamer's personal brand and live content can help viewers overcome their skepticism about a product or company and create a sense of trust in the streamer (i.e., viewers' needs/situations understood) [40]. Secondly, similar social figures are more likely to form a relationship and interact with each other [41]. This is because the similarity helps validate important aspects of the viewers' self-concepts and identities [14]. The attitudinal similarity between a viewer and the streamer thus is likely to induce perceived intimacy. Finally, a live streamer is the object of direct contact with all of his/her viewers. Their superior customer response

capability will enable them to respond to their customers' needs effectively, thereby making them feel they are deeply cared for [42]. The three factors we selected are as follows:

Authenticity: Authenticity means that live streamers show the reality of things and a balance between commercial motivations and sincerity [40].

Perceived Attitudinal Similarity: Perceived attitudinal similarity refers to viewers' perceived similarity with live streamers in their general outlook, values, beliefs, and problem-solving approaches [43]. For example, a streamer who often shows his/her pet dog during a live stream are more likely to be perceived as an animal lover.

Consumer response capability: This refers to a live streamer's ability to respond to his/her viewers' requests in a timely and effective fashion [42]. For example, when a live streamer is about to sell out a preset quantity of a product, with increasing viewer inquiries about the product during the live stream, the live streamer proactively contacts the vendor to prevent stockouts. Figure 1 represents our research model.

2.3. Authenticity

Authenticity in advertising refers to something that is related to reality, and is actual and genuine with regards to advertising execution [44]. In the live stream shopping context, authentic cues conveyed by streamers may include consistent personal brand image, credible commodity information, [45] and creations of scenes similar to real life [46]. It has been pointed out that authentic cues spread by live streamers as a source of information can help viewers generate a sense of trust, overcome skepticism and build relationships with live streamers [41, 47].

Authenticity is a multidimensional concept that includes four dimensions in authentic advertising execution: preserving (personal) brand essence, honoring (personal) brand heritage, showing realistic plots and presenting credible messages [40]. First, personal brand essence refers to the core values of a live streamer. An authentic live stream helps express the streamer's core self and genuine image. Preserving personal brand essence thus may increase the perceived sincerity of the live streamer, leading to increased intimacy between the streamer and his/her viewers.

Second, personal brand heritage refers to a live stream's connection to the streamer's personal brand tradition. Brand heritage reminds viewers of a live streamer's personal brand longevity and reliability [40]. When a live streamer promotes a product in his/her usual style or with a similar personal aura, viewers are more likely to trust the product and increase their emotional commitment to the streamer. Any deviation from the

streamer's traditional style and thus disconfirmation of viewers' expectations will likely result in undesirable surprises to and distrust by the viewers.

Third, realistic plots reflect everyday life situations in which a live streamer presents a product in contexts similar to real life. For example, a live streamer recommends the use of a lipstick in daily life in the voice of an ordinary, unidealized character, such as the viewer's old friend. A realistic plot makes it easier for the audience to immerse in a similar scenario as if he/she were in the streamer's, and imagine their own consumption of the same product like the streamer does [31]. This thus can evoke viewers' emotional attachment to the live streamer.

Finally, message credibility is key to persuasion [40]. Nowadays, consumers are getting used to and even expect exaggerated messages in marketing ads. Credible messages in a live stream thus will strengthen viewers' trust in and emotional attachment to a live streamer [31]. Therefore, we posit that:

H2: Live streamer authenticity is positively correlated with viewers' perceived online intimacy.

2.4. Attitudinal similarity

Similarity is another important factor that facilitates persuasion [41]. People prefer buying products recommended by spokespersons who resemble their own image [48]. When the audience perceive that they share similar values and views on something with a live streamer, they are more open to messages delivered by the said streamer, leaving themselves exposed to the streamer's influence [49]. Previous studies pointed out that attitudinal similarity has a positive impact on the relationship quality, contributing to the mutual attraction between live streamers and their audience [50, 51]. As a result, when live streamers express similar views or demonstrate similar attributes to those of their viewers, they may be regarded as appropriate references by their audience [52] and help validate viewers' personal worth and important aspects of their identities [14], leading to their perceived intimacy with the streamers. With increased exposure to the same streamers, the attitudinal similarity and emotional attachment will be strengthened [53, 54]. We thus propose:

H3: Viewers' attitudinal similarity with live streamers is positively correlated with viewers' perceived online intimacy.

2.5. Customer response capability

Customer response capability refers to live streamers' competence in serving customer needs through effective and quick actions [42, 55]. It includes

two dimensions, namely customer response expertise and customer response speed. Customer response expertise refers to the extent that live streamers can effectively meet customer needs. Customer response speed refers to the extent that live streamers can rapidly meet customer needs. Many live streaming platforms support fast and focused feedback functions, such as "barrages", which allow real-time comments from viewers being posted onto and floating across the screen as the video plays, making the barrage look like flying bullets. Live streamers thus can respond quickly to stimulate audience's demands, assist customers' evaluations and selections of products [7], and establish and maintain relationships with viewers [56]. The quick responses can also provide live streamers with opportunities to resolve issues with viewers before they get worse [55]. Viewers thus feel their needs are known and cared for deeply by streamers, leading to perceived intimacy and close relationships with the streamers [42]. Accordingly, we propose that:

H4: Consumer response capability is positively correlated with viewers' perceived online intimacy.

3. Methodology

We conducted a survey to investigate our research questions. We adopted the scales developed by previous scholars with minor wording changes to suit the live streaming context. All items were measured on a five-point scale, ranging from "strongly disagree" to "strongly agree." Below are the measures used in this study:

Online engagement (reflective-reflective construct). 18 items were used to measure the three dimensions of online engagement [13], including affective, cognitive and behavioral engagement. Example items included: 'I am interested in anything about the streamer and his/her live stream,' 'Time flies when I am interacting with the streamer,' and 'I seek information from the streamer.'

Intimacy. We used the scales of Yim et al. [57] and Park and Lee [36] to measure intimacy. The scale examined the audience-streamer affection and the extent to which the audience was socially connected to the streamer. Example items included: 'I experience great happiness while watching the streamer's live stream' and 'When chatting with a streamer through barrages, I feel that s/he truly understands me'.

Authenticity (reflective-formative construct). Authenticity includes four formative dimensions, namely the preservation of the streamer's personal brand essence and personal brand heritage, realistic plot, and message credibility [40]. We used 19 items to measure the four first-order constructs. Example items included: 'With regard to the streamer's personal brand image, the live stream was suitable,' 'There is a link

between the live stream and the streamer's personal brand legacy,' 'The content of the live stream showed a realistic life situation' and 'The message of the live stream was accurate.'

Attitudinal similarity. We used a 3-item reflective scale of Hernandez [58] to measure viewers' attitudinal similarity between themselves and the streamer. Example items included: 'The streamer and I see things the similar way,' 'the streamer's and my views and values are very similar,' and 'Overall, the streamer and I have a similar interpretation of things.'

Customer response capability (reflective-formative construct). Customer response capability includes two formative dimensions, namely customer response speed and customer response expertise. 6 reflective items were used [55] to examine the degree to which the streamer responds quickly to the audience's needs and the degree to which the streamer effectively meets the audience's needs. Sample items included: 'When the streamer identifies a new viewer need, s/he is quick to respond to it,' 'When the streamer finds that viewers are unhappy with their product or service, s/he takes corrective action immediately, and 'the streamer can satisfy my needs much better than other streamers.'

Control variable. We controlled four variables to rule out rival explanations for our results, namely viewer's gender, age, video watching frequency, and the streamer's gender. First, online engagement can vary due to gender differences [59]. It is found that compared to their male counterparts, female users are more willing to use the Internet for social engagement and have a more positive attitude towards online social activities [60, 61]. The gender of the streamer may also influence viewers' perceived intimacy and engagement. Second, age can affect individuals' ability and willingness to develop intimate relationships with others [62, 63]. Adults are equipped with more abilities to establish intimate relationships [64]. Further, younger generations are also found to be more willing to establish intimate relationships with others through the Internet [65]. Finally, intimate relationships are regarded as a positive outcome resulting from long-term interpersonal interactions [13, 36, 66]. Therefore, we measured viewers' video watching frequency.

We asked respondents to our survey to recall their interactions with one live streamer in the recent past (e.g., their favorite or a familiar one). The survey was pretested on 12 college students from a local Chinese university. After filling out the questionnaire, the respondents were interviewed for examining appropriateness of the description and the format. Confusion and defective items were detected and modified.

We collected data by publishing a link on Sina Weibo, which is the largest blogging platform and a popular social application in China [67, 68]. Sina

Weibo allows users to access all sorts of information, including news, corporate advertisements, celebrity updates etc. In addition, users can follow other users and post comments without restrictions. As of Q3 of 2018, the number of active users of Sina Weibo has exceeded 400 million, about one-third of China's total population.

We collected our data from January 31 to February 29, 2020. In total, 537 valid responses were received. Table 1 demonstrates the characteristics of the respondents. The results showed that almost 90% of the respondents were between 20 and 40 years old. About 80% of the respondents were female. The skewed distribution is about the average (75.4%) of two recent live stream studies conducted in China [1, 69], in which female respondents accounted for 61.11% and 89.7% respectively. Furthermore, nearly 60% of respondents watched live stream shopping once a week.

Table 1. Characteristics of Respondents

Category	Description	Frequency	%
Gender	Male	112	20.86
	Female	425	79.14
Age	0—19 years old	52	9.68
	20—29 years old	468	87.15
	30—39 years old	15	2.79
	≥ 40 years old	2	0.37
Watching Frequency	Once a year	43	8.01
	Once a month	170	31.66
	< 3 times a eek	239	44.51
	>3 times a week	57	10.61
	Every day	28	5.21

4. Data analysis and results

A partial least squares (PLS) using SmartPLS 3.3.2 was constructed for measurement validation and hypothesis testing. PLS was appropriate for our study because it was recommended for hierarchical component models [70, 71], particularly those with reflective-formative second-order constructs.

4.1. Measurement Model

We assessed the validity and reliability of the items and constructs based on the guidelines by Hair et al. [70, 71]. For our first-order constructs, the saturated model fit with the standardized root mean square residual (SRMR) was 0.051, which was below the cut-off value of 0.08 [72]. Outer loadings for most items were higher than 0.7 and significant at 1% level except for one item of intimacy. We deleted such item from our model. The rho_A, composite reliability (CR) and Cronbach's alpha estimates (Appendix A) were above 0.65, indicating good internal consistency and the

reliability of the scales. We further assessed convergent validity using average variance extracted (AVE) criterion [71]. The AVEs of all first-order constructs exceeded the minimum threshold value of 0.5 (Appendix A), demonstrating sufficient convergent validity.

Discriminating validity was established by (1) the items loaded higher on the construct that they were intended to measure than those on other constructs; (2) the square root of the AVE by each construct was higher than the interconstruct correlations; and (3) the heterotrait-monotrait ratio of correlation (HTMT) was significantly smaller than 1 [73]. Our data showed that all the items loaded higher on their own construct than those on other constructs (due to page limit, cross-loading table provided by request). As shown in Appendix A, the square root of AVE of all first-order constructs was greater than the absolute value of the correlation coefficient between the constructs. The HTMT values presented in Appendix A were significantly lower than 1, with 95% confidence interval. These results indicated discriminant validity.

For the second-order formative constructs, authenticity and customer response capability, we first assessed collinearity [70, 71]. The variance inflation factor (VIF) values lower than 5 indicated the absence of multi-collinearity. We found that the VIF of first-order constructs of authenticity and customer response capability were below 2.6, thus indicating that collinearity was not a critical problem. We further assessed the significance and relevance of the first-order reflective constructs for the second-order formative construct. We conducted the bootstrapping procedure with 10,000 samplings. The result reveals that all path coefficients, from first-order constructs to the second-order constructs, are significant at $p < 0.001$ level (Figure 1), thus revealing the significant contribution of the first-order constructs to the second-order construct.

For the second-order reflective construct, online engagement, we first assessed the loadings from online engagement to affective engagement (0.865; $p < 0.001$), behavioral engagement (0.91; $p < 0.001$), and cognitive engagement (0.882; $p < 0.001$). We then manually calculated and assessed the AVE (0.785), composite reliability (0.75), and Cronbach's alpha (0.86) of online engagement, which indicated good consistency reliability and convergent validity. Discriminant validity among the first-order constructs was demonstrated above as HTMT values were significantly smaller than 1.

Common method variance (CMV) was tackled using the measured latent marker variable approach [74]. We adopted the items used to measure 'computer software usage habits' [75] as marker variable. We first assessed the correlation between the marker variable and latent variables that was lower than the

predetermined value of 0.5. We then used the marker variable as predictor to point to all potential variables, indicating no change of the correlation signs of path coefficients and significances. We thus concluded that CMV was not a serious problem.

4.2. Structural Model

We first evaluated the estimated model fit of SRMR that was 0.087, which was slightly above the threshold of 0.08. However, as this study was a predictive-oriented research and the goal was to maximize the explained variance of online engagement from the perspective of the intimacy theory [71], we considered it acceptable. We then assessed multi-collinearity by examining each set of predictor constructs separately for each subparts of the research model [71]. In our research model, all the VIF of endogenous constructs were less than 2, which was well below the threshold value of 5 [71]. This indicated there was no multi-collinearity problem in our model. To assess the significance of the path coefficients, a bootstrapping was applied to generate 10,000 samples with a PLS algorithm, no sign changes, a path weighting scheme, and a bias-corrected and accelerated bootstrap [71]. The full model had an R^2 of 60% for online engagement. R^2 for intimacy was 48.9%. With an omission distance equal to 5, all the cross-validated redundancy Q^2 values of endogenous constructs were higher than zero, indicating that the exogenous constructs had predictive relevance for the endogenous constructs under consideration [71].

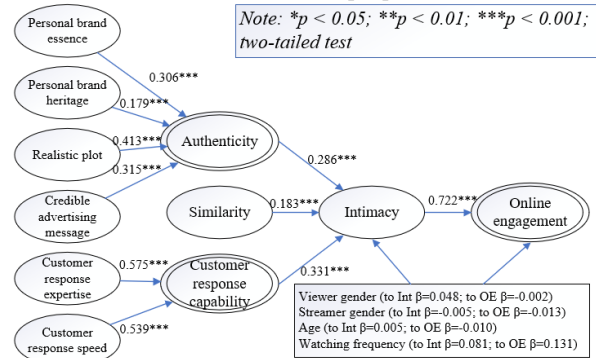


Figure 1. Research and structural model

As shown in Figure 1, the results demonstrate that intimacy has a significant effect on online engagement, thus supporting H1 ($\beta=0.722$; $p < 0.001$). Authenticity positively affects intimacy, supporting H2 ($\beta=0.286$; $p < 0.001$). Similarity is positively associated with intimacy, supporting H3 ($\beta=0.183$; $p < 0.001$). Customer response capability is positively related to intimacy, supporting H4 ($\beta=0.331$; $p < 0.001$). Finally, the effects of control variables on intimacy and online engagement are insignificant, except for the effect of watch frequency on

intimacy ($\beta=0.081$; $p<0.01$) and online engagement ($\beta=0.131$; $p<0.01$). Overall, we note support for all our hypotheses in the research model.

We further conducted a mediation test to examine the indirect effects of authenticity, similarity, and customer response capability on online engagement. We followed the guidelines suggested by Hair et al. [76] and [71]. A bootstrapping with a PLS algorithm, no sign changes, a path weighting scheme, and a bias-corrected and accelerated bootstrap was applied to generate 10,000 samples [71]. The results are shown in Appendix C, and all the indirect effects are significant at the $p<0.01$ level. Due to the insignificance of the direct effect of authenticity on online engagement ($\beta=-0.003$; $p > 0.05$), intimacy fully mediates such relationship. However, since the significance of the direct effects of similarity ($\beta=0.117$; $p < 0.01$) and customer response capability ($\beta=0.14$; $p < 0.01$) on online engagement, intimacy only partially mediates such relationships.

5. Discussion and implications

Our findings provide support for the proposed research model, with live streamers' customer response capability ($\beta=0.331$) and authenticity ($\beta=0.286$) being stronger predictors of viewers' perceived intimacy than attitudinal similarity ($\beta=0.183$). This indicates the importance of the live streamers' authentic embodiment and responsiveness in nurturing viewers' perceived intimacy with streamers.

Our results illustrate streamers' personal brand essence, personal brand heritage, realistic plots and credible messages are important components of their authenticity. The results show that the weight of providing realistic plots in live streams is greater than those of others, making it the most important predictor of streamer authenticity. This is contrary to Becker, Wigand and Reinartz [40], who found that providing realistic plots has a negative effect on TV advertising authenticity and effectiveness. One possible explanation can be that given the one-way communication and pre-recorded contents of TV advertising, even the most realistic plots could be considered well-curated. However, during a live stream, plots unfold in front of viewers and viewers' real-time interactions in the plots can help easily validate its authenticity. Further, authenticity should not be used as a catchall phrase. In our study, authenticity is associated with the streamer (personal brand essence and heritage), the message they deliver (message credibility), and the way they deliver the message (via realistic plots). Future research may examine how these four components complement or interact with each other to contribute to authenticity.

Likewise, customer response expertise and customer response speed are two important components of

streamers' customer response capability. Both the components have significant influences on customer response capability. This suggests that both response expertise and speed are essential in a live stream, concurring with Jayachandran, Hewett and Kaufman [55]. As live streams are usually short, the significance of customer response speed cannot be underestimated.

Our results also demonstrate the importance of audience's perceived intimacy in influencing their online engagement ($\beta=0.722$). This finding concurs with Lomanowska and Matthieu [34], which concludes that intimacy increases online engagement.

Furthermore, our findings point to the significant mediation effects of intimacy, which fully mediates the relationship between authenticity and online engagement, and partially mediates that between attitudinal similarity and online engagement, and that between customer response capability and online engagement. The full mediation effect of intimacy on authenticity suggests that customer mistrust as an issue, particularly in China, can be substantially eliminated by perceived intimacy, even though such perception is just an illusion. Yet, unlike its offline counterpart, which can be strengthened by reciprocity, how online intimacy can be sustained over time is worth further investigation.

Practically, live stream shopping is a blend of performance/entertainment and sales. Live streamers thus are part a celebrity, part a salesperson, part a coach, and part a friend of their online viewers. Our results demonstrate that live streamers should simultaneously harness their distinctiveness and similarity to build their personal brand and emotional bondage with their viewers. Therefore, live streamers should not be afraid to show their true color, including their unique personality, image, plots, and distinct ways in answering customer questions. As the distinctiveness helps build their unique personal brand, their followers will seek commonalities between them. Attitudinal similarity with certain streamers thus can be the clincher for customers desperate to seek purchasing advice from their trusted live streamers.

6. Conclusion and limitations

This paper has demonstrated how live streamers can enhance viewer online engagement by inducing viewers' perceived intimacy with the streamer. We have found that live streamers' authenticity and customer response capability and attitudinal similarity with their viewers play crucial roles in creating the perceived intimacy. The paper has found that live streamers' authenticity and customer response capability are stronger predictors of viewers' perceived intimacy than their attitudinal similarity with viewers. The paper has also indicated that presenting realistic plots is the

strongest predictor of streamer authenticity. Likewise, this paper has pointed out streamers' response speed and expertise in answering customer questions are almost equally strong as indicators of their customer response capability. Finally, we found that although viewers' perceived intimacy with streamers is but an illusion, it significantly mediates the above relationships.

However, this study has suffered from some limitations. First, we used a multi-dimension formative scale to measure authenticity [40]. However, authenticity in a TV advertising setting [40] can differ from authenticity in a live stream setting, in which viewers can easily validate credibility of messages or clarify their confusion via real-time interactions with streamers, such as posing questions or comments. Second, our samples comprised mainly Taobao Live users in China. The generalizability of the model and findings on other live streaming platforms in different cultural contexts may require further research. Finally, viewers were asked in our questionnaire to recall their interactions with one live streamer. However, to reduce the negative impact of memory slips or other confounds, we asked them to recall interactions with their favorite streamer or the one they are familiar with in the recent past.

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Appendix A. Interconstruct correlations, reliability measures, and HTMT

	α	ρ	A	CR	AVE	AE	BE	CE	INT	PBE	PBH	RP	CAM	SIM	CRE	CRS
AE	0.89	0.89	0.92	0.64	0.80											
BE	0.87	0.87	0.90	0.61	0.68(0.77)	0.78										
CE	0.89	0.90	0.92	0.65	0.61(0.68)	0.74(0.84)	0.80									
INT	0.87	0.87	0.90	0.60	0.76(0.87)	0.67(0.76)	0.60(0.66)	0.77								
PBE	0.83	0.83	0.88	0.59	0.46(0.54)	0.31(0.37)	0.20(0.24)	0.50(0.60)	0.77							
PBH	0.78	0.78	0.86	0.60	0.36(0.43)	0.30(0.37)	0.27(0.32)	0.35(0.43)	0.45(0.56)	0.78						
RP	0.87	0.88	0.90	0.61	0.52(0.59)	0.40(0.45)	0.32(0.36)	0.53(0.61)	0.63(0.74)	0.44(0.53)	0.78					
CAM	0.88	0.88	0.92	0.74	0.52(0.59)	0.43(0.49)	0.38(0.43)	0.54(0.62)	0.57(0.66)	0.33(0.39)	0.73(0.82)	0.86				
SIM	0.86	0.86	0.91	0.78	0.54(0.61)	0.47(0.54)	0.37(0.43)	0.52(0.62)	0.41(0.48)	0.30(0.36)	0.49(0.57)	0.53(0.61)	0.88			
CRE	0.69	0.69	0.83	0.62	0.59(0.75)	0.45(0.58)	0.38(0.48)	0.59(0.77)	0.49(0.64)	0.37(0.50)	0.53(0.69)	0.52(0.66)	0.49(0.64)	0.79		
CRS	0.68	0.69	0.83	0.61	0.53(0.68)	0.43(0.56)	0.38(0.49)	0.50(0.64)	0.41(0.55)	0.41(0.56)	0.48(0.61)	0.42(0.54)	0.40(0.51)	0.61(0.88)	0.78	

Note: (1) Square roots of AVE are presented on the diagonal. (2) HTMT are presented on the parentheses

PBE: streamer personal brand essence; PBH: streamer personal brand heritage; RP: realistic plot; CAM: Presenting a Credible Advertising Message; SIM: Attitudinal similarity; CRS: Customer Response Speed; CRE: Customer Response Expertise; INT: Intimacy; AE: Affective engagement; CE: Cognitive engagement; BE: Behavioral engagement.

Appendix B. Means and standard deviations

Var.	Means	S.D.	Var.	Means	S.D.	Var.	Means	S.D.	Var.	Means	S.D.	Var.	Means	S.D.	Var.	Means	S.D.
AE1	3.54	0.82	BE4	3.19	0.97	CAM1	3.27	0.88	CRS3	3.55	0.8	SIM3	3.45	0.85	PBH4	3.77	0.8
AE2	3.22	0.93	BE5	3.15	0.97	CAM2	2.96	1.04	INT1	3.38	0.89	PBE1	3.67	0.72	RP1	3.53	0.95
AE3	3.64	0.82	BE6	3.33	0.92	CAM3	3.29	0.87	INT2	3.62	0.82	PBE2	3.53	0.87	RP2	3.54	0.93
AE4	3.53	0.87	CE1	2.83	1.05	CAM4	3.39	0.86	INT3	3.21	0.92	PBE3	3.53	0.88	RP3	3.38	0.89
AE5	3.58	0.86	CE2	2.99	1.02	CRE1	3.33	0.82	INT4	3.42	0.92	PBE4	3.64	0.83	RP4	3.49	0.85
AE6	3.47	0.88	CE3	2.65	1.08	CRE2	3.57	0.84	INT5	3.42	0.89	PBE5	3.62	0.83	RP5	3.6	0.86
BE1	3.16	1	CE4	3.1	1	CRE3	3.68	0.83	INT6	3.31	0.96	PBH1	3.42	0.92	RP6	3.62	0.87
BE2	3.03	1.03	CE5	3.14	1	CRS1	3.55	0.89	SIM1	3.35	0.86	PBH2	3.62	0.88			
BE3	3.21	0.98	CE6	3.1	0.98	CRS2	3.45	0.83	SIM2	3.39	0.85	PBH3	3.6	0.87			

Appendix C. Significance analysis of the direct and indirect effects

Paths	Direct effect	t value	p <0.05?	Indirect effect	t value	p <0.05?	Mediation
Authenticity → Online engagement	-0.003	0.065	No	0.168	5.616	Yes	Full mediation
Similarity → Online engagement	0.117	2.925	Yes	0.107	3.768	Yes	Partial mediation
Customer response capability →	0.14	3.215	Yes	0.196	6.378	Yes	Partial mediation

Online engagement							
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