

10-5-2023

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Gloria Hui Wen Liu
Massey University, New Zealand, g.liu2@massey.ac.nz

Cecil Eng Huang Chua
Missouri University of Science and Technology, USA, aehchua@gmail.com

Neil Chueh-An Lee
National Chiayi University, Taiwan, Neil_lee@mtm.ncyu.edu.tw

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Recommended Citation

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ISSN 1943-7544

Pacific Asia Journal of the Association for Information Systems

Research Paper

doi: 10.17705/1pais.XXXXX

Volume XX, Issue X (202X)

Engaging Viewers in Ecommerce Live Streaming: Perspectives of the Broadcaster and Viewer

Gloria Hui Wen Liu¹, Cecil Eng Huang Chua², Neil Chueh-An Lee^{3*}

¹Massey University, New Zealand, g.liu2@massey.ac.nz

²Missouri University of Science and Technology, USA, cchua@mst.edu

^{3,*}National Chiayi University, Taiwan, neil_lee@mtm.ncyu.edu.tw

Abstract

Background: *ECommerce live streaming has enabled new forms of broadcaster-viewer interaction, where broadcasters engage viewers in real time to sell goods and services. It is therefore critical to discover strategies to maximize viewer engagement with broadcasters.*

Method: *A mixed methods approach was applied. Five strategies emerged from our qualitative observation of three famous broadcasters: establishing a personal brand essence, maintaining personal brand consistency, creating message credibility, tapping on shared attitudes, and maximizing customer responsiveness. Based on a signaling theory perspective, we then hypothesized about the five strategies and constructed a survey to examine the effectiveness of these strategies. A total of 505 valid responses were received, and CB-SEM with AMOS was utilized to test the five hypotheses, with three hypotheses supported.*

Results: *Our findings demonstrate that message credibility, shared attitudes, and customer responsiveness play critical roles in enhancing viewers' engagement behaviors.*

Conclusion: *Our mixed methods approach allows empirical exploration of effective engagement strategies and broadcaster-viewer interaction during eCommerce live streaming. This study thus contributes nascent knowledge to the live streaming literature, helping future research to develop possible theoretical perspectives. Our findings also provide actionable insights for broadcasters to enhance viewer engagement and boost sales.*

Keywords: Live Stream Shopping, Viewer Engagement Behavior, Engagement Strategy.

This research article was submitted on April-2023 and under two revisions, accepted on August-2023.

Citation: Liu, G. H. W., Chua, C. E. H., & Lee, N. C. A. (in press). Engaging Viewers in Ecommerce Live Streaming: Perspectives of the Broadcaster and Viewer. *Pacific Asia Journal of the Association for Information Systems*, XX(X), XX-XX. <https://doi.org/10.17705/1pais.XXXXX>
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Introduction

Live stream shopping is a new way of advertising and selling products highly popular in Asia (Kumar & Gupta, 2023; Ma et al., 2022; Sun et al., 2019; Xue et al., 2020; Zhang et al., 2023). In live stream shopping, a person (the broadcaster) advertises and demonstrates the product to an online audience in real time (Kumar & Gupta, 2023; Wu et al., 2023). During the demonstration, additional information on the product is overlaid on the live streamed video, including product discounts (e.g., coupons), interaction text (e.g., viewers' instant comments and likes), and statistics (e.g., numbers of viewers or transactions). Viewers type real-time questions about the product including pricing, shipping, product functionality, etc. during the live broadcast. The questions can be instantly replied to verbally by the broadcaster (Ma et al., 2022). Live stream shopping offers viewers a pseudo in-store shopping experience, where they can engage in interpersonal interaction with the broadcaster (Li et al., 2021; Xue et al., 2020; Zhang et al., 2023). The higher degree of synchronous interaction between the broadcaster and viewers and display of other viewers' real-time comments increases viewers' willingness to buy and reduces their uncertainty (Chou & Nguyen, 2023; Kang et al., 2021; Lu & Chen, 2021; Wongkitrungrueng & Assarut, 2020).

Live stream shopping works in two ways. First, it encourages sales directly. In 2018, Taobao, one of the largest e-commerce companies in the world sold USD\$14.93 billion of merchandise through live streaming (Yurou, 2019). This number grew to over USD\$174.25 billion in 2021 and is expected to reach USD\$310 billion in 2025 (iiMedia, 2022). In 2019, the live stream broadcaster Viya sold out all 15,000 bottles of Kim Kardashian West's (KKW) perfume in a few minutes (Canaves, 2019). In the year prior to the Viya-KKW live stream, the brand sold less than 3,000 bottles (Luo, 2020).

Second, live stream shopping attracts marketing attention. Viya's perfume livestream attracted over 12 million views. Previously, KKW perfume had only 104,000 Chinese followers (Canaves, 2019). It is considered an engaging marketing format- 80% of consumers prefer livestreams to blogs (Clark, 2022). It is now a normal marketing channel used by many top brands including Amazon, Wayfair, Ralph Lauren, Sisley, and Burberry (Pixako, 2020). Certain local Chinese brands (e.g., Florasis and Perfect Diary) even use live stream shopping as their main marketing channel (Sina News, 2021).

The broadcaster is critical for enhancing the live stream shopping experience. Beyond hawking products, broadcasters demonstrate how products are used, and answer viewers' questions in real time (Chou & Nguyen, 2023; Lu & Chen, 2021). The vicarious demonstration of products is particularly important for experience products where viewers can only evaluate product quality in use. However, how broadcasters engage viewers in behaviors beyond transaction has been little studied (Hu & Chaudhry, 2020; Kang et al., 2021; Lu & Chen, 2021).

One key metric broadcasters focus on is viewer engagement behaviors (i.e., viewers' interaction with a brand beyond the transaction) (Kang et al., 2021; Li et al., 2021; Ng & Wang, 2019; Wongkitrungrueng & Assarut, 2020). In many ways, viewer engagement behaviors are as important as live streaming sales. While Viya sold 15,000 bottles of perfume, it was more important that she influenced 12 million potential viewers to buy the perfume in the future and created a tremendous volume of word-of-mouth. Although studies have been conducted on website design to increase viewer engagement behaviors and interaction with eCommerce sites (Bilgihan et al., 2014), the best way to maximize viewer engagement behaviors during live-streaming remains an understudied question (Kang et al., 2021; Wongkitrungrueng & Assarut, 2020; Xue et al., 2020). Further, the majority of prior studies on eCommerce livestreaming have focused on viewers' purchase intention, instead of viewer engagement behaviors (Chen et al., 2022; Gao et al., 2021; Guo et al., 2022; Lu & Chen, 2021; Park & Lin, 2020; Sun et al., 2019; Zhang et al., 2023).

Within the limited literature, most works explore traditional approaches to online shopping, including trust in sellers and products, utilitarian and hedonic value, and product fit (Lu & Chen, 2021; Sun et al., 2019; Wongkitrungrueng & Assarut, 2020; Xue et al., 2020; Zhang et al., 2022). Furthermore, work on live streaming focuses on consumption rather than on viewership and how broadcasters influence viewers (i.e., the broadcaster-viewer dynamic) (Lu & Chen, 2021; Park & Lin, 2020). We maintain live streaming is a new marketing approach and thus the effective mix of marketing techniques specific to live streaming is unique. The research question the paper intends to solve is *which of the strategies broadcasters commonly adopt to engage viewers beyond transactional behaviors are effective?*

Broadcasters engage viewers mainly through engagement strategies that signal their unique qualities and credibility (Wei et al., 2022). Some broadcasters, based on their established expertise accumulate large numbers of followers. Originally, mega broadcasters were defined as broadcasters who accumulate over one million followers and exert massive influence over their followers' behaviors and decisions (Campbell & Farrell, 2020). In this study, we consider mega broadcasters to be those who have over ten million followers. This is because having over a million followers is no longer an atypical situation in China (Thomala, 2023; Wang, 2023). Investigation of mega broadcasters' engagement strategies can have important implications in how broadcasters in general engage viewers. Accordingly, we employed a mixed methods approach to understand effective live streaming techniques to maximize viewer engagement behaviors from the perspective of the broadcaster (Study 1) and viewer (Study 2) (Creswell & Creswell, 2017). Two studies were conducted, one exploratory (Study 1) and the other confirmatory (Study 2). We first performed an exploratory qualitative study to identify engagement strategies by observing the live streaming actions of three mega broadcasters on Taobao Live. Based on a signaling theory perspective, we then hypothesized about and tested the effectiveness of these strategies using a survey of 505 Chinese livestream shoppers. Our principal contribution is a demonstration that viewers are generally engaged when broadcasters create message credibility, tap on shared attitudes, and maximize customer responsiveness in live streams. Concurrent with signaling theory, our findings demonstrate that how broadcasters convey observable and credible signals to viewers matter.

This paper is organized as follows. The next section explains how eCommerce live streaming differs from traditional eCommerce and reviews the literature on viewer engagement behaviors in eCommerce live streaming. We then explained how we conducted a qualitative study (Study 1) to discover potential engagement strategies and devised a quantitative study (Study 2) to test the effectiveness of five discovered major strategies from a signaling theory perspective (Connelly et al., 2011; Mavlanova et al., 2012). This is followed by a general discussion about the two studies and their theoretical and practical implications. Finally, we conclude this paper.

Literature Review

Live stream shopping is a new way to advertise products. In live stream shopping, broadcasters hawk one or more products in real time to viewers. Live streaming is a unique marketing channel affording a mix of features other channels do not. For example, during a live stream, broadcasters can provide hyperlinks. They or their background team can also send private messages to or converse with particular viewers or even suppliers to clarify issues or address problems. Likewise, viewers can interact, and respond to other viewers' comments on a real-time basis (Li et al., 2021; Ma et al., 2022). The comments, called "barrage," are posted onto and float on the video, making the comments look like flying bullets as the video plays. The interactive real-time nature of live stream shopping has been demonstrated to reduce the audience's lack of perceived control (Ma et al., 2022), induce their trust in brands or products (Guo et al., 2021; Ma et al., 2022; Wongkitrungrueng & Assarut,

2020), and improve their consumption experience and acceptance of branded products and services (Faraji-Rad et al., 2017). Research demonstrates live streaming enables an immersive experience (e.g., flow) (Hyun et al., 2022), and interpersonal connection even without actual human contact (Chen et al., 2022; Ma et al., 2022; Zhang et al., 2023). Recent studies find successful broadcasters who present credible product information, care for their viewers (not just commercial interest), and contextualize product usage help create an authentic viewer experience (Gao et al., 2021; Huang et al., 2020) and positive emotions among viewers (Wu et al., 2023). As a result, viewers learn to trust and reward broadcasters with loyalty, and even engage in behaviors that influence others, including providing feedback, spreading positive word of mouth or helping other consumers (Chen et al., 2022; Hu & Chaudhry, 2020; Zhang et al., 2022).

Females of Generation Y and millennials (born between 1982 and 2000) are the principal demographic for live stream shopping in China (Guo et al., 2021; Sun et al., 2019) and Thailand (Wongkitrungrueng & Assarut, 2020). In China, with rising income, postponed life stages and greater social security (e.g., increasing pension coverage by the government), the younger generation are more willing to indulge in discretionary spending and make a substantial proportion of their purchases online (Atsmon et al., 2020). To harness the power of eCommerce livestreaming, it is important to study how broadcasters engage their viewers, and viewers react in this setting.

Viewer Engagement Behaviors

Viewers can react to a brand in a positive, neutral, or negative (e.g., viewer complaint) manner (Dessart, 2017). Viewer engagement behaviors refer to viewers' interaction with a brand or broadcaster beyond the transaction and across various viewer decision making processes (i.e., need recognition, searching, evaluation, and post purchase) (Van Doorn et al., 2010; Zhang & Benyoucef, 2016). Strong viewer engagement behavior reflects viewers' stronger states of connectedness with brands and/or broadcasters, and can create value for the brand (Dessart, 2017), motivating viewers to voluntarily participate in diverse brand-related interactions (Hollebeek et al., 2019). For example, viewers communicate via word of mouth or participate in peer-to-peer conversations and interactions (Zhang et al., 2020). These diverse behaviors further lead to potential positive outcomes, such as viewers' trust in product quality or willingness to purchase (Ma et al., 2022). Prior studies in traditional eCommerce suggest various message or content strategies are effective for engaging viewers, including the use of entertaining content (e.g., humorous or artistic content) (Tafesse, 2015), experiential appeal (e.g., content providing sight, sound, touch or smell experiences) (Ashley & Tuten, 2015), emotional appeal or appeal resonant with social causes (e.g., contents meeting viewer psychological or social needs) (Tafesse & Wien, 2018).

Broadcaster Signaling

In live streams, broadcasters do not just sell products. They greet viewers and build relationships with them as if the broadcaster is a friendly shop owner. Interaction thus is more interpersonal than a traditional video advertisement, even though viewers mainly "talk" by sending instant messages. For example, in one live stream we observed, the broadcaster opened with festive wishes in the dialect of her hometown and invited viewers to guess what that meant. In other streams, the broadcaster responded to a viewer's real-time question about a product presented at a previous live stream by asking for help from her logistics team and updated the viewer about developments during the live stream. The broadcaster-viewer interaction can create a sense of perceived intimacy that makes viewers feel cared for and valued via providing timely responses or personalized information (Kang et al., 2021). Most broadcasters are eager to improve viewer engagement behaviors. But how to do so remains an unsolved question.

Signaling is a kind of presentation that is designed to send information about the quality of products/services and honesty of broadcasters, typically to the advantage of the signaler (Funkhouser, 2022). Signaling posits a rational viewer who lacks the information that they would like to obtain and expects the signaler to honor commitments conveyed through signals (Kirmani & Rao, 2000). Effective signals are costly to produce, and only those who have the advertised traits can produce them. It is intrinsically difficult for signalers without such traits to repeatedly counterfeit effective signals (Connelly et al., 2011; Mavlanova et al., 2012). For example, a retailer with an efficient logistics chain can offer a price matching guarantee where they will offer to refund the difference between theirs and another retailer's price. A less efficient retailer will be unable to do this, because it would mean selling large volumes of product at a loss. Effective signals also must be observable to viewers, such as via multiple senses or inclusion of multiple components (e.g., visual and acoustic) (Barker et al., 2019). That is, broadcasters must communicate product/service value and their credibility in a way so that viewers can receive and understand it. For example, Austin, a famous Chinese broadcaster, tried lipstick on his lips and arm and his assistant broadcaster described the smell of the lipstick. Amongst other things, Austin's willingness to put the lipstick on himself conveyed trust the lipstick carried no harmful chemicals. On the other hand, signals might be received or not. Signals have consequences depending on how they are interpreted by viewers (Alsos & Ljunggren, 2017). Viewers may apply certain criteria when assessing signals and signalers because of their experiences or attributes. For example, people favor those similar to themselves (Alsos & Ljunggren, 2017). So, speaking with an unusual accent can alienate viewers.

In summary, broadcasters' engagement strategies send important signals about the underlying quality of the broadcaster and the product/service they promote. When those signals are sufficiently and accurately perceived by viewers, viewers are more likely to reward broadcasters with loyalty or followership (Connelly et al., 2011; Mavlanova et al., 2012).

Mixed-Methods Design

To gain a deeper understanding about how broadcasters engage their viewers, we adopted a mixed methods approach (Creswell & Creswell, 2017) and collected data from the perspective of the broadcaster (Study 1) and viewer (Study 2). A mixed methods approach incorporates the strengths of both qualitative and quantitative research in a single study. It allows us to address exploratory and confirmatory questions within the same inquiry (Venkatesh et al., 2013). Our approach began with exploratory qualitative observations to derive potential engagement strategies from three mega broadcasters who were effective in engaging viewers. We then tested the strategies with a confirmatory quantitative assessment from a signaling theory perspective (Connelly et al., 2011; Mavlanova et al., 2012). The mixed-methods design enables the revelation of the distinctive perspectives of broadcasters and viewers (e.g., on broadcasters' personal branding) and more accurate inferences than either method alone.

Study 1

In Study 1, we sought to explore broadcasters' engagement strategies. We focus on broadcasters who work on live stream platforms that are not exclusively owned by certain brands. Therefore, signals of the broadcaster are genuinely broadcaster and not brand signals.

Method

The purpose of Study 1 was to derive potentially effective engagement strategies which we evaluated in a confirmatory test on a large sample of viewers in Study 2. We conducted an observation study of three mega broadcasters on Taobao Live, one of the biggest eCommerce

live stream platforms in China. We first selected Austin and Viya,¹ the then top 2 broadcasters in China. However, given the majority of viewers are female, we suspected broadcasters who are female and have females as their target audience were more likely to successfully engage viewers. Thus, we selected Cherie who is known as a lifestyle and fashionista broadcaster for female audiences. The three broadcasters were selected because they have over 10 million followers on Taobao Live (see Table 1) and over 2 years of eCommerce livestreaming experience. They were well-known in China, being constantly on top broadcaster lists (iiMedia, 2021) and were often reported on local Chinese media. Hence, they were ideal for observing effective engagement strategies (Wei et al., 2022). Our qualitative data include recordings of 9 live streams by the three broadcasters over a time period of one week, and recordings of 4 mass media reports of the three broadcasters.

We chose mega broadcasters (i.e., with over 10 million followers) to view because mega broadcasters by definition have developed strategies to attract large followings. Presumably, mega broadcasters have developed successful ways of engaging viewers. The broadcaster market is inherently fragile, with new broadcasters constantly joining and competing with each other (Xue & Liu, 2023). From 2019 to 2020, the number of broadcasters on Taobao Live has grown over six times (Zhang, 2021). By the end of 2021, the number of broadcasters in China had reached 1.234 million (Xinhua News, 2022). The live streaming broadcaster job is described as “Chiqingchunfan” (吃青春饭) among the Chinese (Lin, 2018), literally, to eat spring rice, meaning there is very high turnover. Non-mega broadcasters are more likely to employ non-productive strategies, and including them in the initial sample would increase the likelihood we identified such non-productive strategies as potentially productive.

The observed live streams lasted between 2.5 to 5.5 hours in which the broadcasters hawked and demonstrated a variety of products and brands with their assistant(s), greeted and engaged viewers in small talk, encouraged viewers to share the live streams, gave away coupons and other freebies, and sometimes revealed parts of their private life (e.g., pets or weekend outings). The products sold ranged from food, cosmetics, and apparel/accessories to steaming pots, water purifiers and electric appliances. Each live stream was observed by 4 to 28 million viewers.

Table 1 – Data Sources and Characteristics of Individual Broadcasters and Live Streams

Source: Live stream				
	Broadcaster	Duration	# of Products	Viewer#
1	Austin Li Male, 28yrs old 30m fans as of mid2020	2:25:00	12	8.93m
2		2:52:50	14	9.79m
3		4:01:11	32	15.93m
4	Viya Female, 35yrs old 31m fans as of mid2020	5:34:38	62	28.12m
5		3:40:19	31	14.33m
6		3:54:00	49	18.60m
7	Cherie Female, 30yrs old 17m fans as of mid2020	4:38:41	69	5.15m
8		4:37:37	58	3.85m
9		4:55:00	120	12.34m
Source: Mass media reports				
	Interviewee	Duration	Air Date	
1	Austin	40:38	June 2020	
2	Austin	41:02	June 2020	
3	Viya	44:30	July 2020	
4	Cherie	25:07	Sept. 2020	

¹Viya got in trouble with the Chinese authorities for tax evasion and other financial offences in 2021. Data for study 1 was collected prior to the tax evasion charge (see <https://www.bbc.com/news/world-asia-china-59732499>).

Among the 4 reports, 3 involved television program hosts interviewing broadcasters and documenting their daily routines. Table 1 lists data sources and characteristics of the individual broadcasters and live streams.

Analysis began by identifying individual products or product sets (e.g., different colors of the same coat, matching pieces of an outfit). For example, assistant broadcasters would demonstrate how a coat matched a skirt, a pair of jeans, or a dress by doing a catwalk during the livestream. In our second step of analysis, we treated each product interaction (i.e., the broadcaster hawking a specific product or product set) as the unit of analysis and compared and contrasted between them. The first author performed the coding, with the second author playing the role of devil's advocate who challenged the first author's potential bias (Gioia et al., 2013). Discrepancies were discussed and clarified with more evidence and literature review until agreements were reached. For example, the first author initially coded evidence associated with product characteristics as evidence of "authentic personal brand." The second author challenged these codes, arguing the personal brand was not authentic, given broadcasters' commercial interest and the need to translate the live stream into sales. Indeed, evaluating the authenticity of broadcasters (agents) and products (objects) involves distinct criteria (e.g., intrinsic motivation vs. financial rewards or original vs. fake) (Newman & Smith, 2016). Both authors then agreed to differentiate broadcasters' personal branding efforts from product introduction. The third author did not get involved in Study 1 but performed the statistical analysis for Study 2.

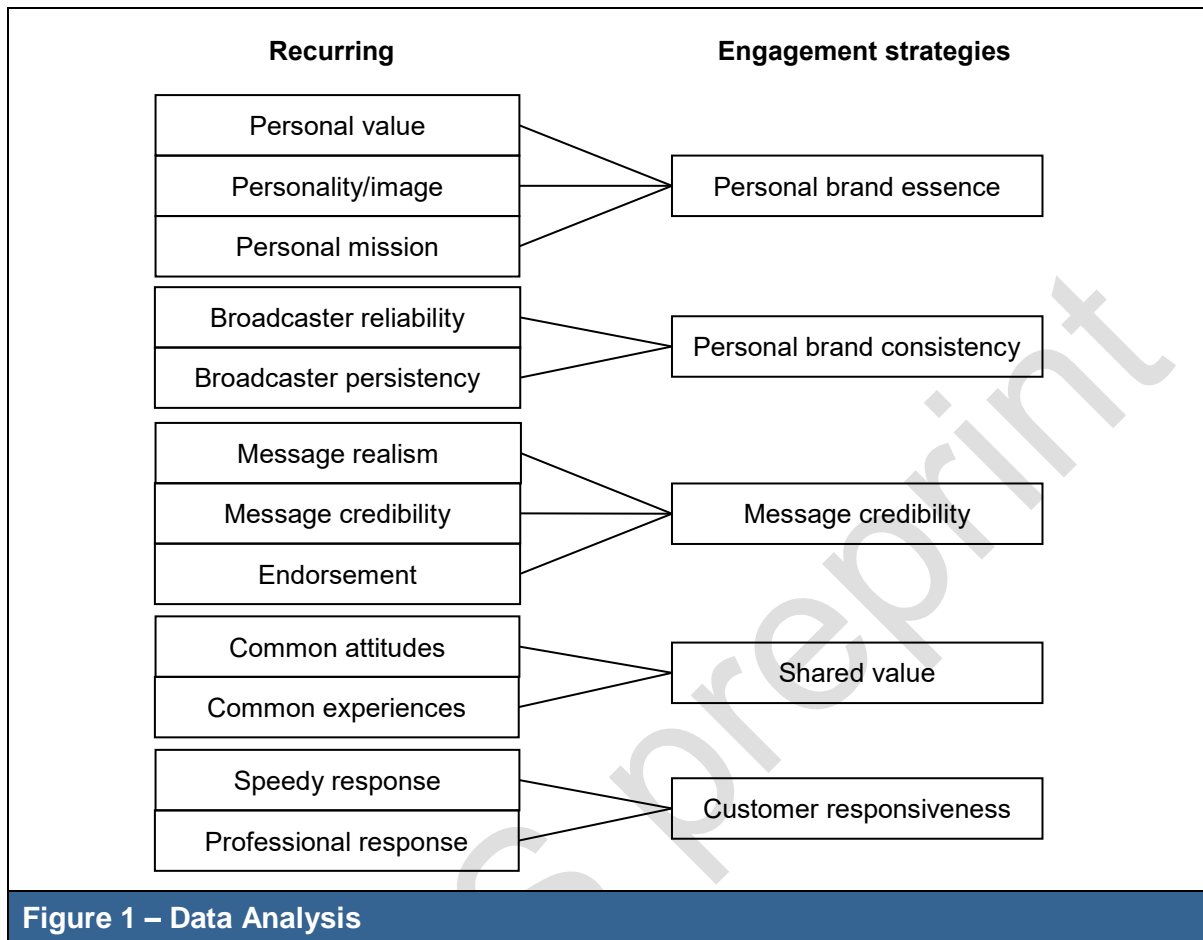
We found many common codes across the live streams (Strauss & Corbin, 1990). Recurring codes included "message realism," "message credibility," "endorsement," "personal brand," "speedy response," "professional response," and "price incentives". We then summarized the codes (i.e., axial coding) into several core categories (i.e., engagement strategies). For example, we aggregated "professional response" and "speedy response" to develop the core category of "maximizing customer responsiveness." Both professional and speedy response are required and closely interrelated in eCommerce live streaming because of the short window of time for broadcasters to effectively tackle emerging issues.

Due to our focus on viewers' behaviors beyond simple transactions (i.e., viewer engagement behaviors), we excluded engagement strategies that were principally transactional (i.e., transactional strategies), such as broadcaster use of discount coupons, gifts or lower prices. Transactional strategies have been found to have no significant relationship with viewer engagement in the context of eCommerce live streams (Hu & Chaudhry, 2020). Indeed, transactional exchange emphasizes market forces and short-term exchange wherein each party operates out of their own interests, whereas relational exchange emphasizes parties' commitment in mutually beneficial interactions and exchanges (Fruchter & Sigué, 2004). Viewers interested in price discounts can be easily suborned by competitors, and thus is not associated with our endogenous construct of interest- viewership engagement.

Five engagement strategies emerged from our data that demonstrated the ways mega broadcasters engaged viewers. They include mega broadcasters establishing a personal brand essence, maintaining personal brand consistency, creating message credibility, tapping on shared attitudes, and maximizing customer responsiveness. Figure 1 summarizes how we derived the strategies from recurring codes. We illustrate the five strategies in the next section.

We further triangulated our findings with the 4 mass media reports of the mega broadcasters. For example, the code "personal brand" which emerged from product interaction was echoed in the reports. Viya is called "DoraViya" after the cartoon character "Doraemon," and Austin is called "the lipstick brother." Likewise, the code "shared attitudes" was echoed in the reports. Austin explained his intention to promote local Chinese brands out of his pride in his nation, and Cherie talked about the job/family demands shared among her generation of Chinese

women and her intention to help them juggle those demands by providing lifestyle and fashion recommendations.



Results and Discussion

Five strategies emerged from our data analysis, namely establishing a personal brand essence, maintaining personal brand consistency, creating message credibility, tapping on shared attitudes, and maximizing customer responsiveness. These five strategies were used to formulate hypotheses tested in Study 2.

Establishing a personal brand essence: A personal brand essence refers to broadcasters' deliberate promotion and demonstration of their core values and image based on their personal strengths and weaknesses (Thompson-Whiteside et al., 2018). Broadcasters' personal brand essence creates a unique and memorable personal image for viewers and makes broadcasters stand out from the rest of the pack (Becker et al., 2019; Wei et al., 2022). While broadcasters are the face for particular products and services, broadcasters also build an audience for their personal brand. Viya, for example, has been praised for her genuine passion for serving her fans:

“A TV crew once came to film my daily life. After a few days, they said that I am boring because I am exactly the same on and offline...I'm always upbeat...passionate about my job...I am like a bridge...among our suppliers, fans, employees... If I don't do my best, it will fail many people...I am such a person, always afraid that I may not do well enough...a fans with a cancer once left me a message, thanking me and telling me that she hopes I could keep bringing them the best products...” (Viya, TVreport3).

Personal brand essence is a costly signal to produce and impossible to replicate. It involves a unique combination of individual characteristics that makes each broadcaster stand out from others (Thomson, 2006). It requires broadcasters' deliberate investment of time and effort to discover their personal values, beliefs and goals, and develop a desired image to signal their worth to their target audience (Parmentier et al., 2013). Based on the evidence, we formulated the hypothesis:

H1: The broadcaster's personal brand essence is positively associated with viewer engagement behaviors

Maintaining personal brand consistency: Unlike product brand, personal brand is argued to be less stable and fixed (Thompson-Whiteside et al., 2018). Thus, how to communicate and consistently deliver a unique promise of value is potentially challenging. Personal brand consistency means a broadcaster's core values and image (i.e., personal brand essence) do not vary across circumstances and time. Consistency reminds viewers of a broadcaster's reliability and trustworthiness (Becker et al., 2019). For example, the lipstick brother, Austin, is well known for his frank expression of approval or disapproval of products regardless of how prestigious the product brands are. In Livestream3, Austin stated on screen that while a luxury-brand handbag he was hawking had an interesting design, his personal opinion was that its aesthetic design was only suitable for special occasions. He warned his fans this was not an easy item to match with their daily outfits.

Indeed, maintaining personal brand consistency facilitates viewers' recognition of a broadcaster's brand essence and generates higher viewer preference, because of the similarity among a broadcaster's personal image across various situations (e.g., service failures) (Liu et al., 2017). Austin's diligent policing of product design and quality reinforces his credibility. In contrast, personal brand inconsistency can dilute brand essence, causing the broadcaster to develop a reputation for dishonesty (Connelly et al., 2011).

As a signal, personal brand consistency is difficult to imitate because it is built over a steady stream of small efforts (Rangarajan et al., 2017). The livestreaming industry expects broadcasters to maximize sales and project their commercial values. The underlying commercial motivations create tension (Becker et al., 2019). Broadcasters who continually balance such tension and maintain their brand consistency across circumstances and time (e.g., via a mix of personal revelations and promotional contents, or consistent emphasis on quality) develop a reputation for authenticity and honesty others find difficult to imitate (Marwick & Boyd, 2011). Thus:

H2: The broadcaster's personal brand consistency is positively associated with viewer engagement behaviors

Creating message credibility: Credibility involves a broadcaster using factual evidence, balanced viewpoints (e.g., by comparing with similar products), and/or endorsement by professionals or authority to persuade viewers. For example, in Cherie's live streams, closeup shots were frequently used to demonstrate the texture or color of clothing pieces. In Livestream2, Austin compared the lotion he recommended with other brands in terms of their ingredients, usages (e.g., shake before use) and cost-performance ratio:

"This lotion contains calamine that can be used to treat mild acne, like the period-induced acne. It can dry out the skin to prevent acne breakout...shake it before use... [another brand] contains sulfur...slightly different ingredient and usage...I would recommend this lotion for its better cost performance ratio..."
(Austin, Livestream2).

Further, due to the interactive nature of live streaming platforms, broadcasters can present a product in contexts similar to real life to enhance the credibility of their messages. This makes it easier for viewers to understand how a product can be used. For example, Cherie's live streams feature assistant broadcasters with different heights and weights trying out and commenting on clothes. This resembles the shopping trips girls enjoy with their friends and also helps the viewer appreciate how the clothes would look like on their body type. Likewise, Viya and her assistant broadcasters eat and compare bowls of noodles with and without the marketed sauce to demonstrate how the sauce enhances the visual appeal and taste of the noodles. In Livestream5, Viya presented a report by China Customs to clear viewers' concern over coronavirus on imported seafood she was hawking.

Strong message credibility requires signals that are costly and difficult to imitate (Mavlanova et al., 2012). The signal must be evidence-based and justify the product quality (Becker et al., 2019). For example, while tailoring clothes to fit one specific model is straightforward, it is not so straightforward to adjust clothes to fit a wide variety of body types. That multiple assistants are able to wear a particular design successfully sends a powerful signal about the credibility of a particular clothing design. Hence:

H3: Message credibility is positively associated with viewer engagement behaviors

Tapping on shared attitudes: The three mega broadcasters have been observed to tap on some shared attitudes that resonate with their viewers, such as attitudes towards nationalism and aesthetics. For example, in Livestream2, Austin marketed locally grown quality coffee beans and advocated for local products by appeals to fans' patriotism. This resonated with TVreport1 in which Austin elaborated that he promoted local brands that would make all Chinese proud. In another example, Cherie made use of Chinese females' obsession with a fair skin tone and slim body to promote clothing items:

"This medium-length coat will make you look slim...the A-line design can cover and make your thighs look skinny...the back pleat here can make girls with thick backs look thin...the sky blue and white are bright...bright colors make you look young... and your skin tone fair..." (Cherie, Livestream7).

Tapping on shared attitudes is a costly signal, because it alienates those with different attitudes. In effect, broadcasters forego viewers with different attitudes to more strongly influence those with the same attitude (Kydd, 2003).

Shared attitudes can function as a filter or criteria that viewers use to interpret signals about broadcasters and products they promote (Alsos & Ljunggren, 2017). Viewers who consider broadcasters to have attitudes similar to themselves tend to positively evaluate said broadcasters. The similarity signals are costly for broadcasters, as the signals could isolate the broadcasters from those with different attitudes or if viewers think broadcasters are not on their side. This suggests the hypothesis:

H4: The broadcaster's shared attitude is positively associated with viewer engagement behaviors

Maximizing customer responsiveness: The three mega broadcasters were observed to respond to customers' questions, comments, or complaints effectively within a very limited window of time, such as through immediate, corrective action or demonstration of the products live. For example, when being asked about the programmability of a digital weighing scale, Viya walked viewers through a scenario while programming the digital weighing scale live (Livestream6).

In another example, in response to customer complaints about a seafood product sold in a previous live stream, Cherie explained the root cause of the problem (i.e., supply chain glitches) and offered to work jointly with the product provider and shipping company to solve the problem. She made use of social media (e.g., pinned the issue to the top of her Weibo account) to increase the transparency of this issue and to address customer concerns (merchant evading responsibilities). This event demonstrated her expertise in managing the crisis:

“...we pin the issue to the top of Weibo...Issues on social media are very short-lived...in this way, we keep track of this issue and inform you of the progress...we’re taking this issue very seriously...if [the supplier] couldn’t address the issue to your satisfaction, our customer service people will not evade the responsibility...[the supplier] is good at [producing good products]...they’re just inexperienced in facing customers directly and operating the social media platforms...” (Cherie, Livestream8).

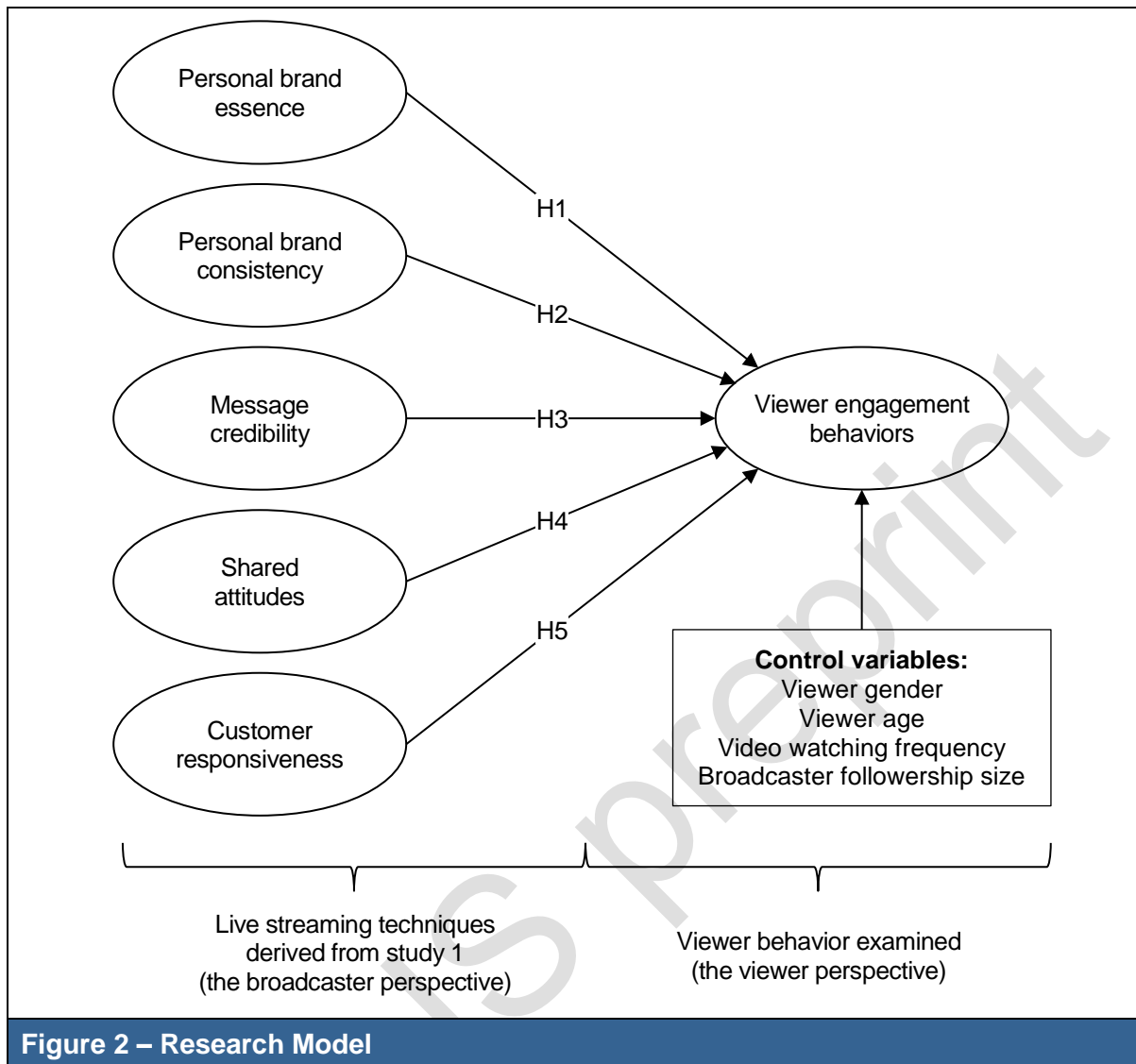
Further, broadcasters need to respond rapidly, because negative comments quickly spread among viewers. Products are often offered during the live stream at a deep discount- the products sold are often really pseudo-giveaways meant to entice viewers to buy the product later by stimulating demand. When the deeply discounted products sell too quickly, the broadcaster negotiates with the distributor for more products at the deeply discounted price on the spot. This often pleases viewers. In many product interactions, we observed the three broadcasters react to products being sold-out by negotiating for more of the product with product suppliers quickly. For example, Austin requested an extra 200 water purifiers for his viewers within a minute after the initial quota of 3,000 units was sold out (Livestream1). In another case, within 90 seconds, Austin was able to negotiate for another 24,000 units (Livestream3).

Like the other strategies, maximizing customer responsiveness is effective as a signal because it is credible and difficult to imitate. Customer responsiveness can incur substantial costs to broadcasters, because of the time and effort spent sorting out problems for customers. This time and effort spent are huge opportunity costs as the broadcaster then cannot promote new products within the limited time window of the live stream (Kang et al., 2021). Thus, customer responsiveness, a costly signal, can be a signal of credibility that differentiates high-quality broadcasters from low-quality ones (Connelly et al., 2011; Kirmani & Rao, 2000; Mavlanova et al., 2012). Hence:

H5: The broadcaster’s customer responsiveness is positively associated with viewer engagement behaviors

Study 2

On the basis of Study 1, we conducted a survey to examine the effectiveness of the five engagement strategies on a larger sample and from the viewer’s perspective (i.e., receivers of signals). Figure 2 is the research model. We analyzed the data using a covariance-based structural equation modelling (CB-SEM) because Study 2 focuses on confirming our findings from Study 1 with a large sample size. Hence, CB-SEM is an appropriate method (Hair et al., 2022; Sarstedt et al., 2016). We used SPSS AMOS version 21.



Method

Because the five strategies were derived from Study 1, we searched the literature for concepts and scales that closely match our findings. We adopted scales from prior studies with wording changes (Becker et al., 2019; Dessart, 2017; Hernandez et al., 2017; Jayachandran et al., 2004). For example, to measure broadcasters' personal branding efforts, we adapted scales of Becker et al. (2019) that were originally designed for measuring brands. All scales comprised reflective items. All items (shown in Appendix A) used in this study were measured on a five-point scale, ranging from "strongly disagree" to "strongly agree."

Viewer engagement behaviors (endogenous construct) was measured by six items reflectively assessing the degree of viewer behavioral participation beyond purchase in live streams (Dessart, 2017). *Personal brand essence (exogeneous construct)* was measured by five items assessing the degree to which the broadcaster builds his/her personal brand image (Becker et al., 2019). *Personal brand consistency (exogeneous construct)* was measured by four items assessing the degree to which the broadcaster maintains the consistency of his/her personal brand and content across time (Becker et al., 2019). *Message credibility (exogeneous construct)* was measured by four items assessing the degree to which the broadcaster presents fact-based or balanced messages about products (Becker et al., 2019). *Shared attitudes (exogeneous construct)* was measured by three items assessing the degree to which

a viewer has similar attitudes with the broadcaster (Hernandez et al., 2017). *Customer responsiveness (exogeneous construct)* was measured by six items measuring the degree to which the broadcaster efficiently and effectively meets viewer needs (Guo et al., 2021; Jayachandran et al., 2004).

We controlled for four factors to rule out rival explanations for our results, namely *viewer gender, viewer age, video watching frequency* and *broadcaster followership size*. First, viewer engagement can vary due to gender differences. It is found that females are more willing than males to use the Internet for social interaction and have a positive attitude towards online social activities (Zhou et al., 2014). Indeed, recent studies about eCommerce live streaming show it is favored by women (Guo et al., 2021; Sun et al., 2019; Xue et al., 2020). Second, viewer age can affect individuals' ability and willingness to engage in interaction and develop relationship with others (Weisskirch, 2018). Among adults, younger generations are more willing to interact with others via the Internet (Abbasi, 2019). Third, viewer engagement behaviors can be shaped by long-term interpersonal interaction (Nguyen et al., 2021; Pandey et al., 2021; Park & Lee, 2019), which is affected by how frequently viewers engage (i.e., watch videos). Therefore, we controlled for viewers' video watching frequency. Finally, broadcasters with different sizes of follower base can leverage their distinct attributes or social capital to influence viewers (Britt et al., 2020; Campbell & Farrell, 2020). For example, broadcasters with a large follower base are found more popular (De Veirman et al., 2017), whereas those with a small follower base are relatable to certain viewers (Britt et al., 2020). Hence, we controlled for broadcaster followership size. We classified broadcasters into two levels (i.e., mega vs. non-mega), with mega broadcasters being followed by over 10 million followers, and non-mega broadcasters less than 10 million. The literature traditionally defines mega broadcasters as having over 1 million followers (Campbell & Farrell, 2020). However, we found using that definition would give us almost no variance. Note that even using a 10 million follower threshold, our sample is split almost evenly in favor of mega broadcasters (i.e., we have 290 surveys about mega broadcasters and 215 non-mega broadcasters).

The survey questionnaire asked respondents to recall one live stream event with one broadcaster 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 to evaluate the survey's items and format. Confusing and defective items were thus identified and modified.

We collected data by publishing a link on Sina Weibo, one of the largest Chinese eCommerce platforms. We collected data for one month in 2020. In total, 537 responses were received. We tested for outliers where 32 cases with a Mahalanobis D^2 exceeding 2.5 were removed, resulting in 505 valid cases (Hair et al., 2014).

Table 2 presents respondents' characteristics. Almost 90% of the respondents were between 20 and 40 years old. Other studies of livestream shopping (Sun et al., 2019; Xue et al., 2020) found over 90% of livestream shoppers are between 20-39 or 18-35 years old. About 80% of the respondents are female. Other studies of livestream shopping (Guo et al., 2021; Sun et al., 2019; Xue et al., 2020) found between 61.11% and 89.7% of livestream shoppers are female. Further, nearly 60% of respondents watched live stream shopping once a week.

Table 2 – Characteristics of Respondents			
Category	Description	Frequency (n=505)	%
Gender	Male	102	20.2
	Female	403	79.8
Age	0—19 years old	49	9.7
	20—29 years old	439	86.9
	30—39 years old	15	3
	≥ 40 years old	2	0.4
Watching Frequency	Once a year	42	8.3
	Once a month	154	30.5
	< 3 times a week	227	45
	>3 times a week	55	10.9
	Every day	27	5.3

We assessed nonresponse bias by conducting t-tests to compare responses of the first and last quartiles of respondents (Armstrong & Overton, 1977). No significant differences were found, suggesting that nonresponse bias should not be a serious concern in this study.

Results and Discussion

We used CFA to assess the reliability and validity of the items and constructs (MacKenzie et al., 2011). The measurement model fit indices are $\chi^2 (276) = 441.657$, GFI = 0.926, AGFI 0.903, CFI = 0.959, RMSEA = 0.047, NFI = 0.925, and RMR = 0.032, exceeding the threshold levels suggested by MacKenzie et al. (2011) and indicating good model fit. Convergent validity is established when the items of a construct collectively tap into the latent meaning of the construct. In this study, the factor loadings for all items are statistically significant ($p < 0.001$), with most exceeding the value of 0.7 (see Appendix A). Eleven items did not pass this threshold, but still exceed the value of 0.6. We deleted five of these items but retained the other six to preserve content validity (Hair et al., 2014). The average variance extracted (AVE) of all constructs exceed the threshold value of 0.5. These results, along with the good overall model fit, suggest acceptable levels of convergent validity. The reliability of the measurements was assessed by computing Cronbach's alpha coefficients and composite reliability (CR) (shown in Table 3), which are all above 0.7, indicating good internal consistency and the reliability of the measures.

Table 3 – Interconstruct Correlations									
Constructs	Cron. α	C.R.	AVE	1	2	3	4	5	6
1. Viewer engagement	0.87	0.88	0.56	0.75					
2. Personal brand essence	0.81	0.82	0.54	0.31	0.73				
3. Personal brand consistency	0.76	0.76	0.52	0.29	0.50	0.71			
4. Message credibility	0.88	0.89	0.66	0.48	0.66	0.35	0.81		
5. Shared attitudes	0.86	0.86	0.67	0.55	0.44	0.36	0.58	0.82	
6. Customer responsiveness	0.75	0.75	0.50	0.53	0.59	0.56	0.62	0.59	0.71

Note: Numbers in bold on the diagonal represent the square root of the AVE

Discriminant validity is established when the square root of the AVE of each construct is higher than the interconstruct correlations. All of values on the diagonal of Table 3, the square root of AVE of individual constructs, are higher than the interconstruct correlations, suggesting sufficient discriminant validity.

We tested and controlled common method variance (CMV) using three confirmatory factor analyses (CFA). Firstly, we applied the CFA-based Harman's one-factor test. In this method, all manifested items are modeled as indicators of a single construct (Malhotra et al., 2006). CMV is considered significant if the single construct model fits the data appropriately. Our results showed that the fit for this model was poor ($\chi^2 (229) = 2317.549$, GFI = 0.644, AGFI=

0.571, CFI = 0.629, RMSEA = 0.135, NFI = 0.606, and RMR = 0.083.). This indicates that CMV is not the primary source of variations in the observed items (Lindell & Whitney, 2001; Malhotra et al., 2006).

Secondly, we employed Lindell and Whitney's (2001) CFA marker-variable technique to control the CMV. This technique involved introducing a theoretically unrelated construct into the research model ('computer software usage habits' in this study) and assessing CMV by recalculating correlations among the constructs (Lindell & Whitney, 2001). Following the procedures outlined by Malhotra et al. (2006), we first examined the measurement model by incorporating the marker construct into the original measurement model. The CFA results indicated a good fit for the data: χ^2 (298) = 562.321, GFI = 0.922, AGFI 0.901, CFI = 0.960, RMSEA = 0.042, NFI = 0.919, and RMR = 0.031. We then assessed the correlations between the marker construct and other constructs and calculated their average. Following Malhotra et al. (2006), we calculated CMV-adjusted correlations (shown in Appendix B). These results revealed that the significance of the correlations remained consistent, suggesting that CMV is not of serious concern.

Finally, we conducted a CFA-based multitrait-multimethod (MTMM) analysis (Malhotra et al., 2006; Podsakoff et al., 2003). Variance in each indicator is assumed to derive from three sources: the construct, the method, and random error. The results from the MTMM analysis indicated a satisfactory fit for the model (χ^2 (282) = 421.817, GFI = 0.944, AGFI 0.924, CFI = 0.978, RMSEA = 0.031, NFI = 0.938, and RMR = 0.026). These findings demonstrate that the relationships and statistical significances of the constructs align closely with the original estimates. Notably, no original correlations deviated significantly from CMV-adjusted values. Consequently, CMV is less likely to significantly alter our conclusions. The correlations between constructs derived from the MTMM analysis are provided in Appendix B.

The structural model was tested using AMOS. Overall, an acceptable model fit is achieved (χ^2 (304) = 591.503, GFI = 0.919, AGFI = 0.899; CFI = 0.95, RMSEA = 0.043, NFI = 0.902, and RMR = 0.039). As shown in Figure 3, the results demonstrated that while *message credibility* (H3; $\beta = 0.225$; $p < 0.001$), *shared attitudes* (H4; $\beta = 0.308$; $p < 0.001$), and *customer responsiveness* (H5; $\beta = 0.344$; $p < 0.001$) are effective strategies to enhance viewer engagement, *personal brand essence* (H1; $\beta = -0.199$; $p < 0.05$) and *personal brand consistency* (H2; $\beta = 0.04$; $p > 0.05$) are not. Surprisingly, *personal brand essence* has a negative effect on viewer engagement. Finally, the effects of control variables and measured marker variable on viewer engagement behaviors are insignificant except for video watching frequency ($\beta = 0.143$; $p < 0.001$).

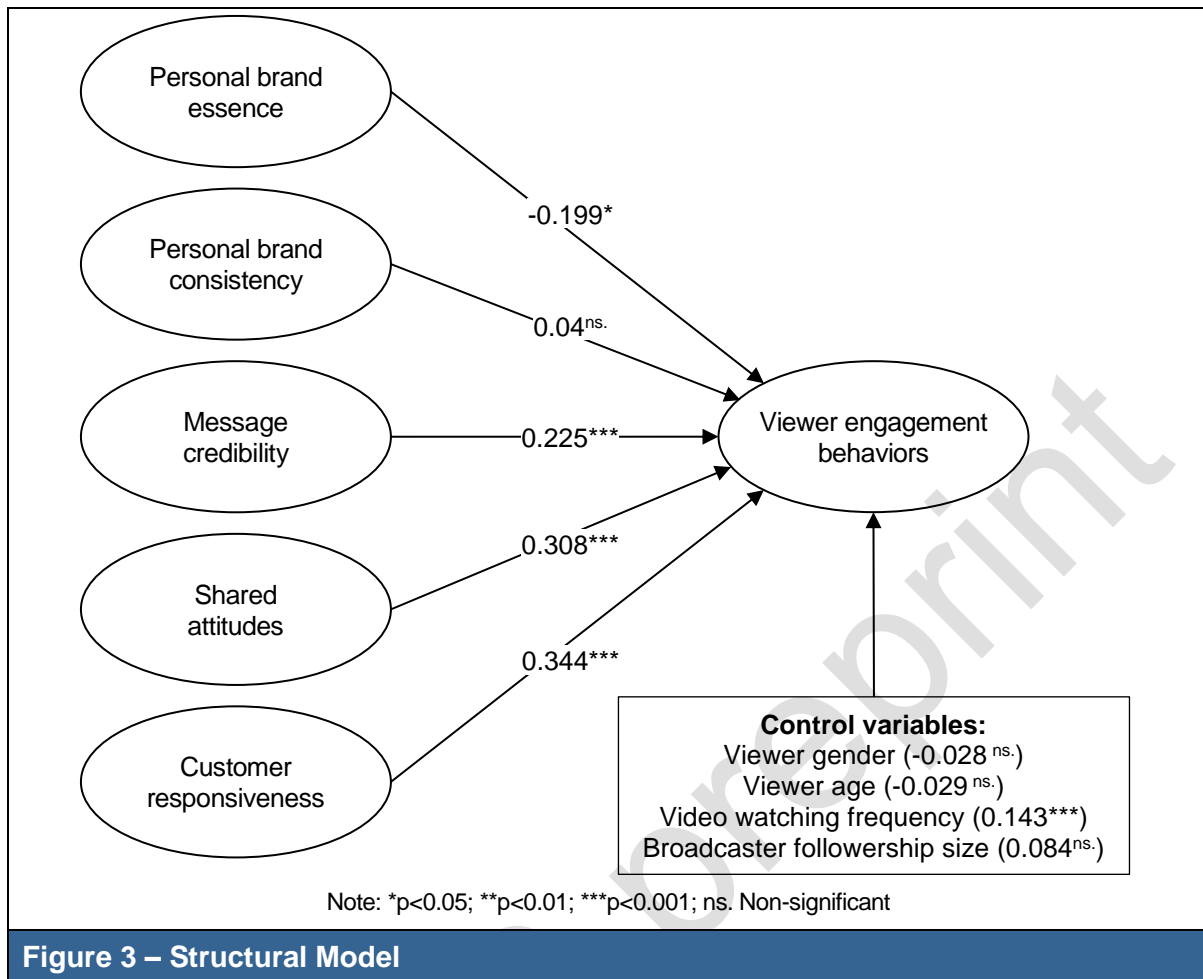


Figure 3 – Structural Model

General Discussion

Study 1 suggested strategies adopted by mega broadcasters to engage viewers. They include *establishing a personal brand essence*, *maintaining personal brand consistency*, *creating message credibility*, *tapping on shared attitudes*, and *maximizing customer responsiveness*. However, Study 2 revealed only a subset of said strategies are effective, namely *message credibility* ($\beta = 0.225$; $p < 0.001$), *shared attitudes* ($\beta = 0.308$; $p < 0.001$), and *customer responsiveness* ($\beta = 0.344$; $p < 0.001$). On the basis of these two studies, it is reasonable to argue that these three strategies are generally effective for engaging viewers. Indeed, the three strategies send credible signals about broadcasters (via *tapping on shared attitudes* and *maximizing customer responsiveness*) and the products they promote (via *creating message credibility*). They indicate the like-minded broadcasters as credible sources of information and the superior quality of products (Chen et al., 2022; Lu & Chen, 2021). Viewers naturally gravitate towards their live streams.

Surprisingly, our survey suggests *establishing a personal brand essence* can be harmful ($\beta = -0.199$; $p < 0.05$). This is incongruent with Wei et al. (2022) in which two mega broadcasters' personal branding is found to enhance viewer engagement. This might be because of hyper-competition in the livestreaming market in China where the majority of broadcasters sell products with no differentiating quality or price (iResearch, 2021). It is also possible that shared attitudes are more important and personal branding alienates the audience by highlighting differences between the broadcaster's and viewers' attitudes. Thus, affiliation with audience could override personal branding. Further studies are warranted.

Also, surprisingly, *personal brand consistency* ($\beta = 0.04$; $p > 0.05$) was not a statistically significant strategy for engaging viewers. Again, we speculate this could be that it is not so much personal brand is important as the broadcaster's affiliation with the audience is important. So long as the brand links to an affiliated group, viewers belonging to that group engage. Furthermore, viewer attitudes change over time. Hence, consistency is not as important as changing the brand to have the attitudes of the affiliated group.

Also, personal brand consistency is an inherently longitudinal construct and our use of a cross-sectional survey could be inappropriate for accurately capturing this construct. Future studies should consider a multi-wave survey to study this concept.

Theoretical and Practical Implications

Overall, our findings in both studies provide support for the three strategies of *message credibility* ($\beta = 0.225$), *shared attitudes* ($\beta = 0.308$), and *customer responsiveness* ($\beta = 0.344$). Juxtaposition of our two studies (Venkatesh et al., 2013) suggests broadcasters must engage viewers cognitively and explicitly to make themselves visible and observable to viewers. It is both the cost and observability of the signal that matter.

Most studies of signaling theory tend to focus on obviously costly acts (Barker et al., 2019; Kirmani & Rao, 2000; Mavlanova et al., 2012). Our findings suggest certain costly signals such as personal branding can be harmful. This is counter intuitive. Some unique socioeconomical factors in China can constrain or enhance viewers' interpretation of personal branding. For example, due to government control, public attitudes in China are relatively homogeneous and personal branding carries risk of government sanction. Our findings suggest personal brands that resonate with viewers are more likely to receive viewer approval. Personal brands are different from product brands, because they are driven by personalities, personal values, beliefs and goals (Fournier & Eckhardt, 2019). Future studies should examine if the negative effect of personal branding on viewer engagement holds in different contexts. Future studies should also examine whether and how broadcasters' affiliation of their brands determine optimal strategies to engage viewers.

Practically, apart from engaging viewers cognitively and explicitly via credible messages, our study indicates the importance of broadcasters' tapping on common mass culture, ideals, or values (e.g., nationalism, or aesthetics) to induce perceived similarity. People are motivated to maintain a positive image of their own group. By evaluating members of their own group positively, they may also maintain a positive image (Kramer, 1991). This is particularly relevant for the Asia Pacific Region where most countries demonstrate a collectivist culture (Erdem et al., 2006). Consequently, broadcasters with shared attitudes face weaker need to signal their credibility to viewers. For brands and marketers, this emphasizes the need to select broadcasters whose attitudes align with the brand's values and target viewers.

Broadcasters should also maximize their responsiveness to build up their credibility. This could send signals about broadcasters' trustworthiness (Connelly et al., 2011; Kirmani & Rao, 2000; Mavlanova et al., 2012) and encourage viewers to engage with broadcasters in future live streams. This may involve brands and marketers providing resources (e.g., customer service support teams) to enable broadcasters to efficiently and effectively respond to viewers or collaborating with broadcasters proficient in viewer interaction.

Research Limitations

As with all studies, this study suffered certain limitations. First, our sample comprises only live stream viewers in China and thus might not be generalizable to other countries. The live

streaming market in China is characterized by hyper competition, a focus on short-term profits (given the short careers of most broadcasters) and state intervention. Nevertheless, given China's ecommerce livestreaming market size of USD\$310 billion in 2025 (iiMedia, 2022), our findings remain valuable.

Second, live streaming has been applied to areas beyond e-commerce such as education, philanthropy, and entertainment. Our study only examines live streaming engagement strategies in eCommerce. It is likely that other factors are important for live streaming in other contexts to influence viewer engagement.

Third, we exclude broadcasters' transactional strategies in this study due to our focus on viewer engagement behaviors. It is possible transactional and engagement strategies could interact in unexpected ways.

Finally, the cross-sectional nature of the survey study (Study 2) could be a limitation as it does not reflect any changes in viewers' perceptions and behaviors over time in relation to broadcasters' engagement strategies.

Conclusion

In this study, we focused on broadcasters' strategies to engage viewers in ecommerce livestreaming. Our findings demonstrate that message credibility, shared attitudes, and customer responsiveness enhance viewers' engagement behaviors. Our findings also reveal discrepancies between the broadcaster and viewer perspectives on broadcasters' branding efforts.

This study suggests several fruitful areas for future research. First, our research found counterintuitively that personal branding can harm viewership engagement. In contradiction, other research finds personal branding enhances the connection between personal brands and followers (Kunkel et al., 2022; Zhou et al., 2020). Future research should pursue this line of inquiry to examine if and how personal brands interact with an affiliated group. Indeed, an affiliated group provides a venue for information about personal brands to spread. This is why social networking is increasingly harnessed to develop and enhance personal brands.

Second, given the unique cultural and other characteristics of the Chinese Internet and eCommerce platforms, the generalizability of our findings to other live streaming platforms in different social and cultural contexts and with different affordances may require further research. The study's findings need to be replicated in other countries and platforms.

Finally, future studies may consider how broadcasters' transactional strategies interact with engagement strategies to influence viewer engagement behaviors. Indeed, different engagement strategies can be adopted for different market segments within the same business (Osman et al., 2009). Transactional strategies can complement the relational approach by targeting niche segments with competitive offers.

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Appendix A – Measurement Items

Appendix A – Measurement Items			
Scale indicators	Mean	S.D.	Loadings
Personal brand essence With regard to the broadcaster's overall personal image, the live stream was: 1. Consistent. 2. Congruent. 3. A Good Fit. 4. Well Aligned. <i>Dropped item: Suitable.</i>	3.53 3.53 3.63 3.61	0.85 0.86 0.82 0.81	0.67 0.63 0.80 0.81
Personal brand consistency 1. There is a link between the broadcaster's broadcasts and his/her personal brand. 2. The broadcaster's broadcasts connect to his/her personal brand. 3. The broadcaster's broadcasts create a connection with his/her personal brand. <i>Dropped item: The broadcaster's broadcasts reflect his/her personal brand.</i>	3.62 3.61 3.77	0.86 0.85 0.79	0.77 0.70 0.67
Message credibility 1. The message of the live stream was accurate. 2. The message of the live stream wasn't exaggerated. 3. The message of the live stream was based on facts. 4. Overall, the message of the live stream was credible.	3.30 3.00 3.30 3.41	0.85 1.00 0.84 0.84	0.89 0.74 0.78 0.84
Shared attitudes 1. The broadcaster and I see things in the similar way. 2. The broadcaster's and my views and values are very similar. 3. Overall, the broadcaster and I have a similar interpretation of things.	3.34 3.38 3.44	0.84 0.83 0.83	0.78 0.84 0.84
Customer responsiveness 1. When the broadcaster identifies a new viewer need, s/he is quick to respond to it 2. The broadcaster can satisfy my needs much better than other broadcasters. 3. The broadcaster has a reputation for effectively meeting viewer demands. <i>Dropped items:</i> <i>My complaints are not quickly responded to.</i> <i>When the broadcaster finds that viewers are unhappy with their product or service, s/he takes corrective action immediately.</i> <i>The broadcaster can easily satisfy my needs.</i>	3.56 3.59 3.68	0.76 0.79 0.80	0.75 0.69 0.69
Viewer engagement behaviors 1. I share my ideas with the broadcaster. 2. I share interesting content with the broadcaster. 3. I help the broadcaster. 4. I try to get others interested in the broadcaster. 5. I actively defend the broadcaster from its critics. 6. I say positive things about the broadcaster to other people.	3.14 3.02 3.21 3.20 3.15 3.31	0.98 1.00 0.97 0.95 0.95 0.90	0.77 0.78 0.70 0.69 0.70 0.83
Measured marker variable 1. I try to use various functions of computer software 2. I learn the function of software by trial and error 3. I try to use the new functions of the software 4. I understand how to use computer software correctly	3.72 3.53 3.86 3.71	0.92 0.93 0.82 0.87	0.79 0.72 0.81 0.76

Appendix B – CMV-adjusted Estimates

Appendix B – CMV-adjusted Estimates			
Construct correlations	Uncorrected estimates	CMV-adjusted estimates	CFA-based MTMM
		$r_m = 0.243167$	
r (shared attitudes, personal brand essence)	0.437***	0.256***	0.448***
r (personal brand essence, personal brand consistency)	0.494***	0.331***	0.526***
r (shared attitudes, personal brand consistency)	0.362***	0.157***	0.307***
r (personal brand consistency, message credibility)	0.349***	0.140***	0.302***
r (personal brand essence, message credibility)	0.656***	0.545***	0.649***
r (shared attitudes, message credibility)	0.58***	0.445***	0.549***
r (shared attitudes, customer responsiveness)	0.59***	0.458***	0.577***
r (message credibility, customer responsiveness)	0.62***	0.498***	0.6***
r (personal brand consistency, customer responsiveness)	0.556***	0.413***	0.519***
r (personal brand essence, customer responsiveness)	0.591***	0.460***	0.601***
r (shared attitudes, viewer engagement behaviors)	0.529***	0.378***	0.572***
r (customer responsiveness, viewer engagement behaviors)	0.545***	0.399***	0.458***
r (message credibility, viewer engagement behaviors)	0.481***	0.314***	0.415***
r (personal brand consistency, viewer engagement behaviors)	0.291***	0.063***	0.189***
r (personal brand essence, viewer engagement behaviors)	0.311***	0.090***	0.375***
Note: CMV-adjusted estimates and t statistics are calculated by following equations (Malhotra et al., 2006):			
(1) $r_A = \frac{r_u - r_M}{1 - r_M}$			
(2) $t_{\alpha/2, n-3} = \frac{r_A}{\sqrt{\frac{(1-r_A^2)}{n-3}}}$			
where r_A is a CMV-adjusted estimate correlation; r_u is an uncorrected correlation; r_m is the average correlation between the marker construct and the other constructs; n is the sample size.			

About the Authors

Gloria Hui Wen Liu received the Ph.D. degree in information systems from the National Central University, Taoyuan, Taiwan, in 2015. She is currently a Senior Lecturer with the School of Management, Massey University, Auckland, New Zealand. Her research interests include digital innovation and transformation, technology project management, and knowledge management. Her work has appeared in such journals as IEEE Transactions on Engineering Management, International Journal of Project Management, Journal of the Association for Information Systems, and Project Management Journal, and premium conferences.

Cecil Eng Huang Chua received the Ph.D. degree in information systems from Georgia State University, Atlanta, GA, USA, in 2004. He is an Associate Professor with the Missouri University of Science and Technology, Rolla, MO, USA. He has papers in 10 of the 11 IS Senior Scholar Basket, including in MIS Quarterly and Information Systems Research. He has editorial roles in such journals as the European Journal of Information Systems, Information and Management, Information Systems Journal and Project Management Journal. He has consulted for a range of organizations including Daimler SEAsia, General Motors Singapore, the Singapore Ministry of Defense, and Fonterra, the New Zealand milk cooperative.

Neil Chueh-An Lee received the Ph.D. degree in information management from National Central University, Taoyuan, Taiwan, in 2014. He is currently an Associate Professor with the Department of Marketing and Tourism Management, National Chiayi University, Taiwan. His research interests include organizational agility, enterprise system, and digital marketing. His work has appeared in such journals as Journal of Strategic Information Systems, International Journal of Production Economics, Information & Management, IEEE Transactions on Engineering Management, Pacific Asia Journal of the Association for Information Systems, and premium conferences.

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