The Role of Social Context in Live Streaming Commerce – An Interpersonal Perspective

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Abstract

Purpose - In the dynamic arena of live streaming commerce, the influence of other viewers has surged to the forefront, marking a significant component of the social context. This study ventures into the interpersonal dynamics within live streaming commerce by delving into the effects of two factors – social presence and group identity salience – on consumer attitudes.

Methodology - Two between-subject experiments were conducted to collect data. The hypotheses were verified by analysis of variance (ANOVA) and PROCESS macro.

Findings - Our findings reveal that higher social presence leads to positive persuasive outcomes, whereas the influence of group identity salience appears to be negligible.

Crucially, the results demonstrate that attitudinal persuasion knowledge mediates the impact of social presence on consumer attitudes, shedding light on the underlying processes that govern consumer responses in the context of live streaming commerce.

Originality -This research is one of the first to investigate the heightened visibility of viewers within live streaming commerce, contributing to a nuanced perspective on the instrumental role of social context in driving consumer decision-making processes.

Keywords

Social presence, group identity salience, live streaming commerce, persuasion knowledge, interpersonal perspective

1. Introduction

Live streaming commerce is a type of live audio-visual broadcasting over the Internet where streamers demonstrate products to attract and retain viewers' attention (Shou et al., 2023), which has been recognized by various companies as an important tool to boost sales in recent years. Globally, the sector generated over $299 billion in revenue in 2024 (Statista, 2025). China, the largest live streaming commerce market with 4.92 trillion yuan in sales in 2023 (iResearch, 2024), has seen major platforms like Tiktok, Taobao, and Temu heavily invest in this sector. The popularity of live streaming commerce builds on the integration of social commerce and social media (Cai and Wohn, 2019). Streamers showcase products (Chen et al., 2023) and stimulate impulsive buying (Lu et al., 2016), while viewers interact in real-time with both streamers and each other, shifting from passive reception to active participation. This enhances the sense of presence and mutual influence among viewers. Unlike traditional e-commerce, the prominent visibility of other viewers makes peer influence a more central part of the experience. Streamers already capitalize on this through tactics like collective nicknames, stock alerts, and interactive activities (e.g., comment-based giveaways, follower-exclusive flash sales) to boost engagement and sales. Yet, to our knowledge, no research has systematically examined how these viewer-viewer interactions shape the social context of live streaming and ultimately determine consumer attitudes.

Industrial practice suggests that the social context in live streaming studios, shaped by viewers' presence, can be characterized by two key aspects: social presence generated by

other viewers and the salience of group identity. The real-time interactivity of live streaming enhances the transmission of social cues, strengthens social presence (Liu et al., 2020) and makes virtual interactions resemble face-to-face interactions (Qin, 2020). While the role of social presence has gained academic attention (Zhang et al., 2025; Huang et al., 2022), existing studies mainly focus on social presence facilitated by streamers, technology or general viewers' participation (see Ming et al., 2021; Li et al., 2024), overlooking the growing significance of viewer-generated social presence due to their heightened visibility (Ma et al., 2022). How this viewer-driven social presence constructs the social context in live streaming studios and influences consumer attitudes and behaviors remain understudied.

Furthermore, live streaming enables viewers to socialize and develop shared repertoires including encompasses words, ways of doing things, stories, symbols, or concepts (Goulding et al., 2013), that shapes their cognitions and behavior. A common strategy involves reinforcing group identity cues, such as streamers addressing viewers with collective nicknames, e.g., 'meimeimen (meaning younger sisters in Chinese)' by Jiaqi Li, 'Viya's women' by Viya, similar to how "Swifties" identify Taylor Swift's fans. Streamers also encourage viewers to use these collective nicknames when placing orders or redeeming gifts, strengthening group identity and fostering a sense of belonging. By emphasizing category information, practitioners aim to make group identity more salient in live streaming studios and subsequently influence consumers' response. Nevertheless, the actual effectiveness of these initiatives has not been thoroughly studied yet.

Moreover, the mechanism by which viewer-shaped social context affects individual attitudes and behaviors remains unclear. Zheng et al. (2023) proposed that heightened social presence amplifies viewers' enjoyment and satisfaction during live streaming, which distracts from financial considerations and weaken their recognition of persuasive intent – thus reducing the activation of persuasion knowledge (Evans and Park, 2015). This implies that social presence generated by other viewers shapes how individuals perceive persuasive intent and regulates their response to streamers' persuasive message. Still, this pathway has received limited scholarly attention.

Unlike streamer-viewer interactions, the interactions among viewers define the atmosphere of live streaming studios. Elements such as social presence and group identity salience subtly affect how consumers activate persuasion knowledge, which subsequently determines their attitudes and consumption behaviors. To address the identified research gap (see Appendix A) and provide practical recommendations for optimizing viewer engagement strategies, this study adopts an interpersonal perspective to examine how social presence and group identity salience shape viewer attitudes and behaviors, with persuasive knowledge acting as a mediating mechanism.

2. Literature Review

2.1 Social Presence Theory

"Social presence", originating from by Short et al. (1976), refers to "the salience of interactants and their interpersonal relationships during a mediated conversation" (p.65). It

reflects a psychological sense of mutual awareness and involvement beyond mere physical co-presence (Kim, 2011; Lin & Lee, 2024). While some scholars adopted this concept to explain the level of interaction between people, others tried to measure the quality of such interactions in specific social context (see Bao and Wang, 2021; Huang et al., 2022).

Social presence depends more on interactants rather than on technological features alone (Oh et al., 2018). Even on platforms with limited verbal and nonverbal cues, individuals can employ various strategies to convey socioemotional cues (see Ramirez et al., 2002; Antheunis et al., 2010). Thus, the level of social presence within a social context can be shaped by priming specific personality traits or altering perceptions of psychological distance between interactants (Verhagen et al., 2014). In live streaming commerce, both streamers-viewer and viewer-viewer real-time interactions – such as live chat – jointly shape the communication atmosphere and determine the level of social presence in this context.

Studies suggest that a higher level of social presence in computer-mediated communication (CMC) facilitates the persuasive process (see Botha and Reyneke, 2016; Lu et al., 2016). Unlike traditional e-commerce, live streaming commerce enables more immediate and responsive interaction between viewers due to advancements in information technology (Cai and Wohn, 2019) social presence offered by their counterparts (Ma et al., 2022). This enhanced social presence strengthens emotional bonds among viewers and fosters sustained engagement. Although platforms have introduced interactive widgets to foster participation, their actual impact remains under-examined. To address this gap, this study adopts an

interpersonal perspective to investigate how viewer-generated social presence generated shapes persuasive outcomes.

2.2 The Social Identity Model of Deindividuation Effect

The Social Identity Model of Deindividuation Effect (SIDE, Reicher et al., 1995) posits that individuals possess multiple layers of "self", including both personal identity and various social identities, which are based on membership in different social groups and categories (Rogers and Lea, 2001). The conception of "self" is "both flexible and situation-specific" (p.527), which enables individual's behavior exists along a continuum ranging from personal autonomy (driven by personal standards) to group conformity (shaped by dominant group norms) (Lea et al. 2001). In situations where the transfer of personal information is limited, individuals may experience the depersonalization of self and others, wherein individuals become cognitively represented as group exemplars rather than differentiated selves (Turner et al., 1987). And then individuals tend to define themselves from a group identity perspective, focusing on the shared similarity between the self and communication partners instead of their differences. As a result, their behaviors will be more in line with the normative values, attitudes, and behaviors associated with the respective social group or category (Rogers and Lea, 2011).

Live streaming enables viewers to share communal experiences through immediate interactions. Highlighting group cues in live streaming studio has become a common way of promoting consumers' engagement and facilitating sales in practice. For instance, many

streamers call viewers by a collective name and mention it repeatedly during live streaming selling. Streamers also release various collective tasks to underline the connections between individuals and the group. While completing these tasks, viewers are often asked to act collectively to achieve a common goal and redeem special gifts. These initiatives aim to enhance the group identity salience (Rogers and Lea, 2005) and activate the viewers' group level of self, making them show more supportive attitudes and behavior conforming to the "placing an order" atmosphere within this studio. Based on the SIDE, this study compares viewers' attitudes under varying levels of group identity salience within the interactive context to clarify the effects of those practices.

2.3 Persuasion Knowledge Model

During the persuasion process in live streaming commerce, viewers' persuasion knowledge (PK) tends to be activated to effectively help them cope with persuasive attempts. Campbell and Kirmani (2000) identified two key factors influencing the activation of PK: "cognitive capacity" and "accessibility of agent's motives". In live streaming commerce, a higher level of social presence provided by interactions among viewers tends to facilitate the consumers' immersion in positive experience (e.g., flow state) and reduce attention to the streamer's ulterior motives (Zheng et al., 2023). While recognizing persuasive intent shapes how viewers interpret persuasive messages and behave, its precise impact requires further research.

Although the relationship between the activation of PK and individuals' potential to cope with persuasive attempts has been well-studied (Ham et al., 2015), prior research mainly focused on single dimensions of PK, such as recognition of persuasive or manipulative intent. (Campbell and Kirmani, 2008; Ham et al., 2015). Recent work highlights PK's multifaceted nature (Binder et al., 2022). Rozendaal et al. (2011) distinguish conceptual PK – recognizing advertiser's persuasive tactics and intent (Boerman et al., 2012) – from attitudinal PK – evaluating the fairness or appropriateness of those tactics (Friestad and Wright, 1994). The activation of PK is generally thought to undermine persuasive outcomes (De Jans et al., 2018). Because individuals value autonomy, perceived manipulation often triggers resistance to persuasion attempts (Wei et al., 2008). However, it remains unclear how social presence generated by other viewers in live streaming commerce influences persuasion effectiveness –whether by obscuring persuasive intent or by improving viewers' evaluations of the tactic used. Therefore, the current study adopts a multidimensional view of PK and examines the mediating roles of both conceptual and attitudinal PK in consumers live streaming shopping experiences.

3. Hypotheses Development

Based on the literature review, social presence and group identity salience in the live streaming studio could effectively influence individuals' viewing experience. Drawing on the social presence theory and SIDE, this study categorizes interpersonal influence of live streaming commerce into two key factors: social presence generated by other viewers and

group cues offered in live streaming. Both factors positively affect individuals' attitudes and behaviors. Meanwhile, persuasion knowledge is examined as a mediating variable in the relationship between social presence and persuasive outcomes.

3.1 Social Presence Factors

A higher level of social presence bridges the psychological distance between interactants, increases consumers' trust in both products and streamers, and thus leads to positive consumer attitudes and behavioral intentions (Ming et al., 2021; Zhao et al., 2024; Qin and Liu, 2025). However, existing studies have primarily examined the effects of social presence in live streaming commerce offered by techniques, streamers, and other viewers collectively (see Xu et al., 2025; Zheng et al., 2023; Liu et al., 2020). The importance of other viewers' visibility under this background has not received sufficient attention.

Therefore, this paper specifically compares the effects of social presences arising from viewer-viewer interactions. Based on social presence theory, we propose that higher levels of social presence foster perceived closeness and warmth, diverting attention toward enjoyment and away from critical processing (Zheng et al., 2023), thereby facilitating persuasion process (Yuan et al., 2025), leading to positive attitudes and purchase intention. Hence, the following hypothesis is proposed:

H1: Participants in the higher level of social presence group will a) hold a more positive attitude toward the streamer and b) have a higher purchase intention, compared to others in the lower level of social presence group.

3.2 Group Identity Factors

In the light of SIDE, maximizing the number of group cues in CMC can increase the level of the salience of group identity (Lea et al., 2001) and initiate individuals' supportive attitudes and behaviors (Jackson et al., 2011; Kelly, 1993). Emphasizing group identities is believed to be positively associated with individuals' behavioral involvement (Jackson et al., 2011), and their participation in collective action (Kelly, 1993). Although underscoring group identity in live streams is a common practice, the positive effect of group identity salience in live streaming commerce is still unconfirmed. Based on previous research in other areas, higher group identity salience is believed to be positively associated with consumers' attitudes and behaviors (see Fang et al., 2018; Jackson et al., 2011), hence the following hypothesis is proposed:

H2: Participants in the higher level of group identity salience group will a) hold a more positive attitude toward the streamer and b) have a higher purchase intention, compared to others in the lower level of group identity salience group (see Figure 1).

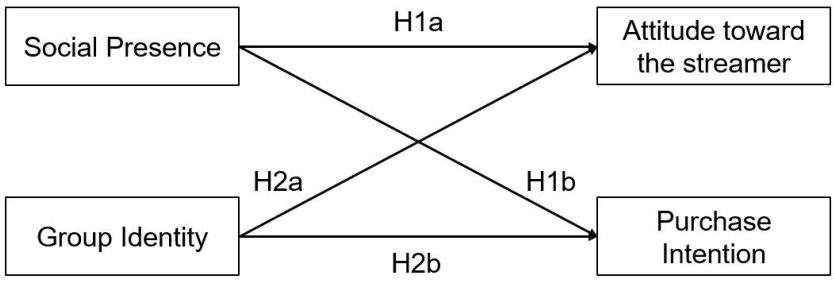

Figure 1.
Research model of main effects (Source: Authors' own creation)

3.3 The Mediator Role of Persuasion Knowledge

Existing research indicates that the activation of PK tends to negatively affect persuasion outcomes (De Jans et al., 2018; Wei et al., 2008). In live streaming commerce contexts, a higher level of social presence promotes viewer immersion, directing cognitive resources toward enjoyment and satisfaction rather than carefully analyzing the persuasive message. This leads to peripheral route information processing, reduced recognition of persuasive intent, and more positive attitude toward the streamer and purchase decisions. Therefore, H3a is proposed:

H3a: The activation of conceptual persuasion knowledge (CPK) mediates the relationship between social presence and consumers' attitude toward the streamer and purchase intention. Specifically, with a higher level of social presence, the consumer's CPK is less likely to be activated and tends to generate supporting behaviors.

Moreover, in situations where higher levels of social presence are offered, consumers are more likely to enjoy the live streaming viewing, and less likely to feel they are being manipulated. The desire to maintain their freedom is satisfied, and the attitudinal tendency to resist persuasion attempts is thereby reduced. Therefore, H3b is proposed:

H3b: The activation of attitudinal persuasion knowledge (APK) mediates the relationship between social presence and consumers' attitude toward the streamer and purchase intention. Specifically, with higher social presence, the consumer's APK is less likely to be activated and tends to generate supporting behaviors (see Figure 2).

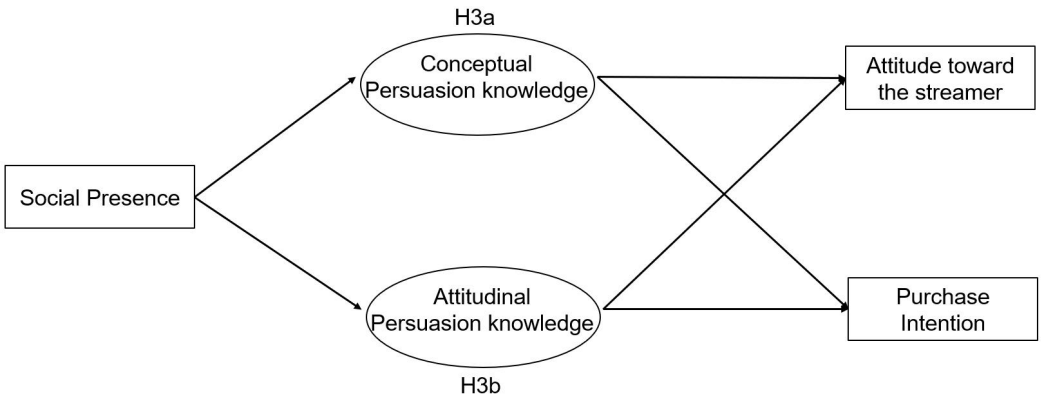

Figure 2.
Research model of mediating model (Source: Authors' own creation)

4. Hypothesis Testing

A pre-test and two online experiments were conducted to test the hypotheses. The experiments have been approved by ethical committee, with the approval number 20220121. The pre-test included two experiments that manipulated social presence and group identity salience by three screenshots simulated live streaming, respectively. Participants were recruited through a professional data collection platform in China named Credamo in May 2022. In the first pre-test, 80 participants were exposed to stimulus material that had either less or more social cues. After reading the stimuli, participants rated the social presence scale (7-point scale, 1=disagree completely, 7=agree completely), which was adapted from Biocca et al., (2001) and Zhao et al. (2015), including 3 items ($\alpha = .760$, e.g., "I am aware that there were other viewers watching the live steaming with me"). A one-way analysis of variance (ANOVA) test revealed a significant difference between two groups in perceived social presence ($M_{low} = 3.73, SD = .94;\ M_{high} = 4.33, SD = .49; F(1, 78) = 12.43, p = .001$). In the second pre-test, 100 participants were exposed to stimulus material that was either with

or without group cues. And then participants rated the group self-categorization scale (7-point scale, 1=disagree completely, 7=agree completely), which was adapted from Lea et al. (2001), including 3 items ($\alpha = .800$, e.g., "I feel a connection with other viewers in this live streaming studio"). An ANOVA test revealed a significant difference between two groups in perceived group identity salience ($M_{without} = 3.85, SD = .64;\ M_{with} = 4.15, SD = .42; F(1, 98) = 7.79, p = .006$). Those results confirmed the validity of the stimulus design for this study.

4.1 Study 1

To test H1-H3, we ran a 2 (social presence: high vs. low) x 2 (group identity salience: with vs. without) between-subject experiment. Participants imagined watching live streaming commerce on a smartphone in which a fictitious streamer promoted a laundry detergent with a fictitious brand. This product was selected based on the FCB grid (Vaughn, 1980) to minimize preference-related confounding effects due to its low-involvement nature.

4.1.1 Stimuli

The stimuli began with a brief introduction to immerse participants in the viewer's role. For the group with group cues, participants were notified they had previously followed the streamer on Taobao Live. The streamer repeatedly mentioned the viewer's collective name and released collective tasks. And a title for each viewer indicating engagement levels was displayed in front of the username when they were posting live comments. Live comments

presented included self-references using the collective name and positive responses to tasks. All group cues were based on Rogers and Lea (2005). For the group without group cues, the streamer simply explained product discounts. And the live comments presented contained no group cues. For the group with a high social presence, live comments presented featured active viewer discussions about the product and the streamer, along with mutual question-answering, enhancing interactivity of this live streaming studio (Liu and Shrum, 2002) and fostering a face-to-face-like communication and thus a higher level of perceived social presence (Cyr et al., 2007). As for the stimulus offered a lower social presence, live comments were largely essentially irrelevant to the current situation, resulting in sparse socioemotional cues and a perception of "distant interaction" (Caspi and Blau, 2008), thereby reducing the level of social presence.

4.1.2 Participants and Procedure

200 paid participants (66.5% female, 77% aged 23-40) from Credamo were recruited in July 2022 and randomly assigned to one of four conditions. After informed consent, participants viewed the stimulus. The questionnaire measured dependent variables first, followed by mediators, manipulation checks, live streaming commerce usage, demographics, and attention checks. This order of question prevented priming effects from questions revealing the persuasive nature of the situation. Pre-screening excluded participants unfamiliar with live streaming commerce, and failures in the attention check led to data exclusion.

4.1.3 Measures

All dependent variables and mediators (see Appendix B) were measured using 7-point Likert scale (1=disagree completely, 7=agree completely). Two dependent variables were included. Attitude toward streamer (AtS) was adapted from Boerman et al. (2012) and van Reijmersdal et al. (2015), included 5 items (e.g., "I think this streamer is favorable"; $\alpha_{AtS} = .897$). Purchase intention (PI) was adapted from Taylor and Baker (1994), comprised 5 items (e.g., "After reading the above pictures and texts, I would like to buy the laundry detergent"; $\alpha = .947$). As for mediators, "understanding of selling intent" (Tutaj and van Reijmersdal 2012) was used to measure CPK (e.g., "The purpose of this live streaming is to sell laundry detergent"; 2 items, $\alpha = .792$). APK was derived from inference of manipulative intent (Campbell, 1995) using 2 items (e.g., "The streamer tried to manipulate the viewers in ways that I don't like"; $\alpha = .862$).

Control variables included demographics (age, gender education) and live streaming commerce usage (viewing frequency, purchase frequency, monthly spending).

4.1.4 Manipulation Checks

Two questions were included at the end of the experiment to check if participants could correctly identify the condition they were exposed to. Chi-square tests revealed a significant difference between groups regarding the number of social cues being perceived

($\chi^2(1,\ 200) = 72.725, p = .000 < 0.05$), as well as a significant difference between groups regarding the number of group cues being perceived ($\chi^2(1,\ 200) = 110.017, p = .000 < 0.05$). Thus, both manipulations in study 1 were successful.

4.1.5 Results

To test H1 and H2, we conducted an ANCOVA analysis. The results revealed that persuasive outcomes were significantly higher when live streaming commerce offered higher social presence ($M_{AtS} = 5.42, SD = .96;\ M_{PI} = 5.49, SD = 1.19;\ n = 100$) compared to those offered lower social presence ($M_{AtS} = 5.04, SD = 1.12; M_{PI} = 5.01, SD = 1.43; n = 100$), $F_{AtS}(1, 193) = 9.16, p = .003;\ F_{PI}(1, 98) = 8.01, p = .005$). Therefore, H1 was supported. The results are somewhat different for H2. Although we found that participants' response was more positive when live streaming offered group cues ($M_{AtS} = 5.32, SD = 1.06;\ M_{PI} = 5.35, SD = 1.33; n = 100$) compared to those without group cues ($M_{AtS} = 5.14, SD = 1.06;\ M_{PI} = 5.16, SD = 1.36; n = 100$), the difference between these two groups was not significant ($F_{AtS}(1, 193) = 1.49, p = .224;\ F_{PI}(1, 193) = 1.278, p = .260$). Therefore, H2 was rejected. The interaction of SP and GI was also examined, and no significant effect was found.

To test the mediation effects proposed in H3, we used model 6 in the PROCESS macro (Hayes, 2017). 5,000 bootstrap samples were adopted to estimate the 95% bias-corrected bootstrap confidence intervals for inferences about indirect effects. The results showed a significant indirect effect of social presence on AtS (indirect effect = 0.2146, BootSE =

0.0877, 95% CI [.0452; .3046]), including the insignificant indirect effect of SP on AtS via CPK (indirect effect =0.0247, BootSE=0.0186, 95% CI [-.0033; .0683]), the significant indirect effect of SP on AtS via APK (indirect effect = 0.1643, BootSE = .0827, 95% CI [.0009; .3278]). A direct effect of SP on AtS was not found (direct effect = .1827, se=.1107, 95% CI [-.0358; .4011]). Based on the results, we can infer that the relationship between social presence and viewers' attitude toward the streamer was mainly mediated by the activation of APK. Thus, H3b was supported. While the mediation effect of CPK was limited, H3a was rejected (see Table 1).

Table 1.
Effects of SP on AtS via CPK and APK (n=200).

Path	Relationship	Path Coefficient	Indirect Effect	BootLLCI	BootULCI	Results
Ind1: SP ➔ CPK ➔ AtS	SP ➔CPK	-.3177*	.0247	-.0033	.3946	Insignificant
	SP ➔AtS	.1725				
	CPK ➔AtS	-.0735				
Ind2: SP ->APK ->AtS	SP➔APK	-.2809*	.1634	.0009	.3278	Significant
	APK➔AtS	-.5496***				
Total indirect effect			.2146	.0452	.3946	Significant
Direct effect			.1827	-.0358	.4011	Insignificant
Total effect			.3972	.1297	.6647	Significant

Notes: *$p<0.05$, **$p<0.01$, ***$p<0.001$
The full name of the constructs refers to Appendix B
Source: Authors' own creation

To test the mediation effects on purchase intention, we used a similar approach in the PROCESS macro. The results demonstrated a significant indirect effect of social presence on PI (indirect effect = .3541, BootSE =.1494, 95% CI [.0673; .6518]), including the insignificant indirect effect of SP on PI via CPK (indirect effect = .0195, BootSE =.0194, 95% CI [-.0119; .0645]), the significant indirect effect of SP on PI via APK (indirect effect

= .2880, BootSE =.1432, 95% CI [.0121; .5717]). A direct effect of SP on PI was not found (direct effect = .1472, se=.1115, 95% CI [-.0727; .3670]). The results again confirmed the of H3b, and a reject of H3a (see Table 2).

Table 2.
Effects of SP on PI via CPK and APK (n=200).

Path	Relationship	Path Coefficient	Indirect Effect	BootLLCI	BootULCI	Results
Ind1: SP ➔ CPK ➔ PI	SP ➔CPK	-.3177*				
	SP ➔PI	.1103	.0195	-.0119	.0645	Insignificant
	CPK ➔PI	-.0461				
Ind2: SP ->APK ->PI	SP➔APK	-.2809*	.288	.0121	.5717	Significant
	APK➔PI	-.7688***				
Total indirect effect			.3541	.0673	.6518	Significant
Direct effect			.1472	-.0727	.3670	Insignificant
Total effect			.5013	.1469	.8557	Significant

Notes: **p<0.05, **p<0.01, ***p<0.001*
The full name of the constructs refers to Appendix B
Source: Authors' own creation

4.2 *Study 2*

4.2.1 Stimuli

In Study 2, we conducted a robustness test of Study 1 with modified stimulus material and expanded the sample size (n=410). Firstly, the female streamer in study 1was replaced by a male streamer to avoid the confounding caused by the participants' preference of streamer's gender. Secondly, laundry detergent – another utilitarian product – was replaced by tissue paper as the product for sale in live streaming studio.

4.2.2 Participants and Procedure

This study was conducted in October 2022 with 410 paid participants recruited via Credamo (61.22% female, 71.46% aged 23-40). The experiment began with informed consent, followed by a filter question to exclude individuals who haven't watched live streaming commerce. Then, the stimulus material was presented, followed by manipulation checks and questions about individuals' live streaming commerce usage. Next, the demographic questions were asked, and the questionnaire ended with attention check questions.

4.2.3 Measures

The measurement for dependent variables and mediators used in Study 2 was adapted from the measurement used in Study 1. All of them were measured on a 7-point Likert scale (1=disagree completely, 7=agree completely). To test the effect on consumer attitude and behavior, we measured two dependent variables, including attitude toward streamer (5 items, $\alpha = .921$), and purchase intention (5 items, $\alpha = .911$). Mediators were composed of CPK (2 items, $\alpha = .75$) and APK (2 items, $\alpha = .794$). In addition, the participants' demographic information and their engagement level of live streaming commerce were controlled.

4.2.4 Manipulation checks

Two questions were included to test whether the manipulation of independent variables was successful. A chi-square test revealed a significant difference between groups regarding the number of social cues perceived ($\chi^2(1, 410) = 116.258, p = .000 < 0.05$), and a chi-square test revealed a significant difference between groups regarding the number of

group cues perceived ($\chi^2(1, 410) = 198.891, p = .000 < 0.05$). Thus, both manipulations in this study were successful.

4.2.5 Results

To test H1 and H2, we conducted an ANCOVA analysis. In support of H1, the results revealed that persuasive outcomes were significantly higher when live streaming commerce offered higher social presence ($M_{AtS} = 5.47, SD = .87;\ M_{PI} = 5.62, SD = .84; n = 206$) compared to those offered lower social presence ($M_{AtS} = 5.10, SD = 1.29; M_{PI} = 5.14, SD = 1.44; n = 204$), $F_{AtS}(1, 396) = 13.78, p = .000;\ F_{PI}(1, 396) = 17.99, p = .000$). Thus, H1 was supported. As for group identity salience, the findings of Study 2 were consistent with Study 1. The difference in attitude and purchase intention between the two groups was insignificant ($F_{AtS}(1, 396) = 2.074, p = .151;\ F_{PI}(1, 396) = .919, p = .338$). Therefore, H2 was rejected. We also tested the interaction of SP and GI; no significant effect was found.

A serial mediation model was used to test H3 (Model 6 in PROCESS macro). The results demonstrated a significant indirect effect of social presence on AtS (indirect effect = 0.2267, BootSE = 0.0733, 95% CI [.0953; .3787]), including the insignificant indirect effect of SP on AtS via CPK (indirect effect =0.0066, BootSE=0.0099, 95% CI [-.0085; .0316]), the significant indirect effect of SP on AtS via APK (indirect effect = 0.2218, BootSE = .0717, 95% CI [.0928; .3695]). A direct effect of SP on AtS was found to be insignificant (direct effect = .1629, se=.0866, 95% CI [-.0073; .3322]). Based on the results, we can conclude that

the indirect effect of social presence on viewers' attitude toward the streamer was mainly realized by the activation of APK. Once individuals encountered situations with higher social presence, they were less likely to activate their attitudinal persuasion knowledge (b =-.4546, p=.0003<.001), and then held a more positive attitude towards streamer (b =-.4787, p=.0000<.0001)). Thus, H3b was supported. Meanwhile, the activation of CPK played an inconsiderable role in this process, Thus, H3a was rejected (see Table 3).

Table 3.
Effects of SP on AtS via CPK and APK (n=410).

Path	Relationship	Path Coefficient	Indirect Effect	BootLLCI	BootULCI	Results
Ind1: SP ➔ CPK ➔ AtS	SP ➔CPK	-.1625	.0066	-.0085	.0316	Insignificant
	SP ➔ AtS	.1466				
	CPK ➔ AtS	-.0366				
Ind2: SP ->APK -> AtS	SP➔APK	-.3527***	.2218	.0928	.3695	Significant
	APK➔ AtS	-.5657***				
Total indirect effect			.2267	.0953	.3787	Significant
Direct effect			.1629	-.0073	.3332	Insignificant
Total			.3896	,1841	.5951	Significant

Notes: **p<0.05, **p<0.01, ***p<0.001*
The full name of the constructs refers to Appendix B
Source: Authors' own creation

Similar to Study 1, we then ran another serial mediation model with purchase intention as dependent variable. The results demonstrated a significant indirect effect of social presence on PI (indirect effect = .2553, BootSE =.0810, 95% CI [.1110; .4298]), including the insignificant indirect effect of SP on PI via CPK (indirect effect = .0038, BootSE =.0090, 95% CI [-.0125; .0250]), the significant indirect effect of SP on PI via APK (indirect effect = .2534, BootSE =.0806, 95% CI [.1099; .4266]). A direct effect of SP on PI was found

(direct effect = .2287, se=.0923, 95% CI [.0473; .4101]). The results again confirmed the full support of H3b, and rejected H3a (see Table 4).

Table 4.
Effects of SP on PI via CPK and APK (n=410).

Path	Relationship	Path Coefficient	Indirect Effect	BootLLCI	BootULCI	Results
Ind1: SP ➔ CPK ➔ PI	SP ➔CPK	-.1625	0.0038	-0.0125	0.025	Insignificant
	SP ➔PI	.1904*				
	CPK ➔PI	-.0193				
Ind2: SP ->APK ->PI	SP➔APK	-.3527***	0.2534	0.1099	0.4266	Significant
	APK➔PI	-.5983***				
Total indirect effect			0.2553	0.111	0.4298	Significant
Direct effect			.2287	.0473	.4101	Significant
Total effect			.4840	.2596	.7085	Significant

Notes: **p<0.05, **p<0.01, ***p<0.001*
The full name of the constructs refers to Appendix B
Source: Authors' own creation

5. Discussion and Conclusion

5.1 Main Findings

Through two online experiments, we confirmed that enhancing social presence by enriching interactions between viewers in live streaming commerce significantly improved viewers' attitudes and behavioral intentions. This aligns with previous research affirming the benefits of social presence in CMC (see Lu et al., 2016; Botha and Reyneke, 2016). The presentation of bidirectional synchronous interactions between viewers in live streaming commerce greatly enhances "perceived intimacy and immediacy" (Short et al., 1976), making individuals more susceptible to persuasion. However, the hypothesis of group identity

salience was not supported. This may due to the transient nature of the live-comment-based interactions, where situational group identity—built on 'swift guanxi' (Ou et al., 2014)—exerts limited social influence in persuasive process. Alternatively, following optimal distinctiveness theory (Brewer, 1991), excessive group cues may have surpassed viewers' optimal belongingness level, triggering a desire for self-differentiation and leading to choices inconsistent with group-advocated behaviors. Thus, group cues did not significantly affect persuasive outcomes in this context.

To further understand the mechanism underlying the impact of social presence on consumers, we investigated the mediation effects of attitudinal and conceptual persuasion knowledge in this context. Results revealed that while conceptual PK did not significantly affect persuasion process, attitudinal PK mediated the relationship between social presence and persuasive outcomes. This implies that even when viewers recognize the streamer's persuasive intent, it does not automatically trigger resistance. Instead, viewers evaluate the perceived fairness of the persuasion tactics directly, which in turn shapes their attitudes and intentions. These finding challenges prior research which the recognition of persuasive/selling intent as a prerequisite for the activation of attitudinal PK (Rozendaal et al., 2011; Jung and Heo, 2019), e.g., inference of manipulation. There are two possible explanations for this inconsistency. First, participants' prior experience with live streaming commerce may foster a 'positive initial disposition' (Sternthal et al., 1978), wherein selling intent is viewed as legitimate rather than manipulative. This disposition makes viewers who enjoy shopping through live streaming less likely to generate negative responses solely based on the selling

intent. Second, viewers do not always take in all persuasive messages conveyed by the streamer. They often evaluate live streaming commerce through other factors, such as the atmosphere in live streaming studios. Moreover, viewers have the autonomy to choose whether or not to watch the live streaming at any time, which makes them take a relatively tolerant stance on selling intent (Lou, 2022). The distinct nature of live streaming commerce compared to traditional advertising thus reshapes the PK model. This aligns with Lou's (2022) findings on influencers-followers' relationships, which may be especially relevant in the Chinese context where streamers often serve as social media influencers as well.

5.2 Theoretical Implications

This study offers several theoretical contributions to literature. First, it innovatively adopts an interpersonal perspective to enrich the literature on social interactions in live streaming commerce. While prior research on live streaming primarily focused on the interaction between the system and viewers, or that between the streamer and viewers (see Wongkitrungrueng and Assarut, 2018; Ming et al., 2021; Yu and Zheng, 2022; Chang et al., 2023; Bao and Zhu, 2023; Cao et al., 2024), limited attention paid to the interactions among viewers (Men and Zheng, 2019). In contrast, this paper explains how interactions among viewers affect individuals' attitudes and behavior, and provides a novel research perspective regarding this topic. Second, this study extends the applicability of Persuasion Knowledge Model by demonstrating that attitudinal PK – but not conceptual PK – mediates the effect of social presence on persuasive outcomes in live streaming commerce, offering insights for

future research. Finally, this paper drew on previous research to design stimuli for the manipulation of independent variables, both social presence and group identity salience. The results of pre-test and manipulation checks confirmed the effectiveness of the experiment manipulations, providing a methodological reference for future research.

5.3 Practical Implications

This paper also offers several practical contributions. First, it highlights the critical role of other viewers and their interactions in live streaming commerce. With more viewers and richer interactions, the atmosphere in this live streaming studio tends to be more warm, sociable, and personal, leading to a more positive response. Hence, platforms can optimize interaction design by integrating more user-friendly social tools to enhance visibility and interconnectedness among viewers. Steamers can emphasize the participation of other viewers, respond actively to comments, and initiate discussions to cultivate a sense of co-presence. Second, results show that group identity salience does not exert a significant effect. Marketers are advised to foster a sense of belonging through more authentic and emotionally resonant methods, such as cultivating niche communities based on shared interests, or having streamers build authentic connections through personal storytelling and experiential sharing. Finally, results indicate that a high level of social presence can attenuate users' defensive reactions to persuasive intent. Streamers may consider integrating sales messages naturally into interactive content. By leveraging immersive social experiences, they can reduce cognitive resistance and enhance receptivity.

5.4 Limitations and Directions for Future Research

This research has several limitations. Firstly, the sample was drawn solely from Credamo, which may affect generalizability despite the platform's diversity. Secondly, the use of fictitious streamers and brands enhances internal validity but limits external validity. Future studies should examine whether the findings remain robust when real brands or companies are incorporated. Thirdly, the findings are based on a low-involvement utilitarian product. Their applicability to high-involvement hedonic products remains to be tested. Furthermore, this paper did not account for disposition PK which refers to an individual's persuasion knowledge that has been formed throughout his/her lifetime via diverse interactions with persuasion agents' attempts (Ham and Nelson, 2019). The limited role of conceptual persuasion knowledge observed here can be attributed to viewers' initial positive disposition of live streaming commerce which is part of an individuals' disposition PK (Ham et al., 2015). Future studies should include this construct further explain the mediation mechanism of PK in live streaming commerce. Finally, as this study focused exclusively on the Chinese context, cross-cultural validation is needed to assess the generalizability of those findings.

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