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An empirical investigation of continuance intention to use online meetings

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This study examines the mechanisms shaping users' continuance intention toward online meeting platforms. Study 1 used semi-structured interviews with 17 Chinese users, analyzed through grounded theory. Guided by the Cognitive–Affective–Conative framework, Study 2 developed a theoretical model and collected 292 valid online questionnaires via convenience sampling. Covariance-based structural equation modeling (CB-SEM) tested the model. Results show that positive emotions exert the strongest positive effect on continuance intention ($\beta = 0.791^{***}$), while negative social presence has a weaker negative effect ($\beta = -0.164^{**}$). Interaction and feedback deficiency ($\beta = 0.58^{***}$) and attention distraction ($\beta = 0.292^{***}$) significantly increase negative social presence, whereas technical advantages ($\beta = 0.226^{*}$) and stress-reducing virtual perception ($\beta = 0.705^{***}$) enhance positive emotional experiences. Self-efficacy significantly moderates the relationship between negative social presence and continuance intention. By integrating qualitative exploration with quantitative validation, this study enriches the understanding of continuance intention in online meetings contexts and provides practical insights for optimizing platform design and user retention.

Keywords Grounded theory, Cognitive–affective–conative framework, Online meetings, Continuance intention

As technology rapidly advances and becomes widely adopted, online meetings have become an indispensable part of modern work and life. Online meetings break the limitation of time and space, improves efficiency and realizes remote interaction. The new normal of remote collaboration formed in the post-epidemic era has caused the platform functions to evolve from a single speech tool to an integrated collaboration ecosystem, and embedding extended functions, project management, real-time translation, and data analysis has become a new trend in the industry.

Despite the increasing use of online meetings, there are still multidimensional challenges to users' continuance intention. Bonfert et al.¹ found that video calls still have limitations, including restricted social interaction between participants. Beyond privacy and security risks, some researchers have pointed out that distortions and delays of video communication can make people feel isolated and anxious². These problems may have common reasons: Online communication cannot fully convey subtle social cues, forcing the user's cognitive system to compensate for the missing information, resulting in psychological fatigue. In addition, the results of a research showed that video meeting is exhausting more than other types of meetings³. All these studies show that the gradually exposed defects of online meetings will continue to affect users' perception and experience. What is more noteworthy is that the user demands of the platform have also shifted from the satisfaction of basic functions to the optimization of high-quality user experience. These studies have shown that the defects gradually exposed by online meetings and the upgrade of user needs have brought considerable challenges to the platform in maintaining users.

Many previous studies have consistently demonstrated the role of cognition. Liu et al.⁴ demonstrated that consumers' cognition and flow positively influence their behavioral intentions in TLSS. The research on the adoption of digital textbooks showed that perceived usefulness had both a positive direct and indirect effect on adoption intentions⁵. Much of the existing literature has used the Cognitive-Behavioral Model, the Theory of Planned Behavior, and the Technology Acceptance Model (TAM) to confirm the influence of cognition on behavioral intention. TAM provides essential insights into initial technology acceptance by emphasizing pre-adoption beliefs. However, continuance intention forms after actual usage, where users develop experience-based cognitions and emotions. Zeng et al.⁶ confirmed that affect did play a mediating role between cognition and conation. Bhattacherjee and Premkumar⁷ further noted that that initial adoption does not equate to

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continuance intention. Cao et al.⁸ highlighted that the TAM mainly focuses on the initial adoption, it does not determine continued use. Meanwhile, prior research has also verified the influence of affective experiences on continuance intention⁹. Accordingly, this study adopts the Cognitive–Affective–Conative (CAC) framework, which is particularly suitable for continuance settings because it emphasizes how post-adoption cognitions and emotional experiences shape users' continuance intention.

Although the CAC framework is considered suitable for predicting continuance intention. Yet, research on online meetings seldom adopts CAC, the subjective perspectives of users have not been fully explored. To fill this gap, we introduce the CAC framework into the context of online meetings continuance intention research to explore the influence mechanism and enrich the theory. To address the shortcomings of existing studies that rely on questionnaires or existing theoretical frameworks, and insist on the natural emergence of users' subjective viewpoints, the study adopts interviews based on Grounded Theory to obtain the most authentic user data.

This study will focus on two questions:

- (1) *RQ1* What factors influence users' continuance intention of online meeting platforms?
- (2) *RQ2* What is the mechanism by which these factors influence the user's continuance intention of online meeting platforms?

To answer these questions, the study adopted a mixed-methods approach. Grounded Theory and the CAC framework are integrated in a sequential and complementary manner to address the research questions. To ensure that factors are grounded in real-world experiences rather than pre-defined categories. In Study 1, semi-structured interviews were conducted with users who had experienced online meetings, and the interviews were coded according to Grounded Theory to summarize the influencing factors. In Study 2, based on the CAC framework, the factors obtained in Study 1 were further divided into different dimensions, and their influence mechanisms were verified by Covariance-based structural equation modeling (CB-SEM). This method combines the depth of qualitative exploration with the rigor of quantitative validation.

This study innovatively introduces the CAC framework into the field of online meeting research. Drawing on Grounded Theory, we identified and categorizes factors influencing continuance intention, then integrated into a chained model of cognitive appraisal—affective experience—continuance intention. This approach clarifies the progressive relationships among cognition (positive/negative evaluations), affect (negative social presence/positive emotional experiences), and conation. Moreover, the study incorporates self-efficacy as a key personal trait, revealing its moderating effect of self-efficacy in linking affective experiences and continuance intention, thereby highlighting its influence on sustained behavioral engagement.

By integrating cognitive, affective, and personal trait factors, this study advances continuance intention research in information systems, effectively addressing the lack of focus on user perspectives in the field and offering a novel explanatory paradigm for understanding and enhancing user retention.

Literature review: online meetings

Changes in user needs for online meetings

In the early 1990s, online meetings were conducted via e-mail. Up to now, online meetings have evolved from a single-function social platform to a multi-threaded collaborative ecosystem integrating information sharing, co-creation and emotional connection. At the same time, user needs have also experienced a significant upgrade: from the early pursuit of connection stability, it has been upgraded to the high-quality pursuit of efficient information delivery, immersive interactive experience and deep emotional connection. As demand escalates, it also affects user satisfaction with online and offline environments. For example, Audiences' higher-order needs such as interactivity and autonomy became more influential determinants of satisfaction than basic technological reliability¹⁰. This difference in satisfaction makes the user's stickiness to the platform (continuance intention) no longer dependent only on technical usability, but also closely linked to the cognitive evaluation and emotional experience during use.

Continuance intention in digital contexts

The shift in factors influencing user stickiness highlights the need to re-examine continuance intention (CI). Bhattacherjee¹¹ pointed out that continuance intention (CI) refers to a user's willingness to continue using a technology or service after its initial adoption. CI places greater emphasis on long-term retention mechanisms, and its influencing factors and formation processes often differ significantly from those in the initial adoption stage. He also noted that many early studies inappropriately used the same concepts and scale items to measure both types of behavior. Theoretically, CI research mainly adopts or extends the Expectation-Confirmation Model (ECM), the Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT)¹². CI has been studied in various digital technology contexts, including mobile applications¹³, social media mobile apps¹⁴, digital platforms¹⁵, online Learning¹⁶, mobile banking¹⁷, etc. In addition, Nabavi et al.¹⁸ pointed out that most CI studies have adopted cross-sectional surveys and structural equation modeling for analysis, and suggested that future research combine experimental designs with multiple data sources to enhance the robustness of causal inference. Overall, CI research has evolved from an early focus on perceived usefulness and satisfaction to a multidimensional, contextualized trend.

The role of affective experience

However, the role of affective experiences in shaping CI, especially in the context of online meetings, remains underexplored. Prior studies suggest that emotions such as enjoyment, anxiety, and frustration significantly influence continuance intention of digital technologies. Shang shanshan et al.¹⁹ further showed that emotional experiences play a key role in shaping continuance intention in online learning contexts. In online meeting

scenarios, weakened social cues, the increase in cognitive load, and the uncertainty of communication exacerbate emotional responses, making affective experience a key factor that determines users' continued use.

Given the role of emotional experiences in shaping continuance intention, it is equally important to recognize that individual traits may also be at the core of strategies to sustain users' continued use.

The influence of personal traits: self-efficacy

Self-efficacy was first proposed by Bandura to describe an individual's self-judgment of their ability to accomplish a specific task. Waddington²⁰ pointed out that self-efficacy can indirectly influence behavior performance by affecting an individual's motivation, emotional state, and strategy use. In the field of information systems, Compeau and Higgins²¹ were the first to propose a measurement framework for computer self-efficacy (CSE) and developed a widely used scale, this framework not only provides a standardized measurement tool for subsequent research, but also promotes a large amount of empirical work to verify the impact of self-efficacy on user attitudes and behaviors in different digital technology contexts.

Self-efficacy has been proven to be an important personal factor influencing user attitudes and behaviors. For example, Demirag²² found that self-efficacy drives social presence and emotional attachment in the metaverse, which in turn affects continuance intention. In the context of online learning, self-efficacy not only directly influences continuance intention but also indirectly affects it by enhancing perceived usefulness and learning satisfaction²³. Online gaming research has revealed that players with high self-efficacy exhibit greater persistence and achievement motivation when facing challenging tasks, thereby maintaining longer participation cycles²⁴. Research by Bao and Shang²⁵ in the Web 2.0 platform context further confirmed the positive relationship between self-efficacy and continuance intention. Overall, the existing literature consistently indicates that self-efficacy is not only an important antecedent of technology acceptance but also a core psychological variable for sustaining long-term use and forming psychological dependence.

Theoretical foundation

To deeply explore the real and natural experience feelings of users, this study processes and analyzes the results of user interviews based on Grounded Theory. It was developed by sociologists Glaser and Strauss in 1967. Grounded Theory builds a theory from real data gathered through an iterative process of coding and analysis. This theory helps researchers to construct new hypotheses from empirical data rather than relying on existing theories²⁶. This is a bottom-up inductive research process, which emphasizes that researchers form theories by coding and analyzing raw materials layer by layer, rather than verifying existing hypotheses, and Grounded Theory is more helpful in discovering previously overlooked or unanticipated answers. The study adopts this approach precisely based on its strong exploratory advantages, aiming to break through the limitations of established theoretical frameworks, systematically identify and refine the key factors influencing the behavioral continuance Intention toward online meetings directly from users' real experiences and subjective evaluations, especially those complex emotional dimensions (e.g., negative social presence) and cognitive evaluations (e.g., attention distraction, etc.), all of which lay the foundation for constructing more explanatory theoretical models in subsequent studies.

Fishbein and Ajzen proposed the Theory of Reasoned Action (TRA), which for the first time systematically integrates the relationship between cognition and behavioral intentions²⁷. But Bagozzi²⁸ Self-Regulation of Attitude Theory describes cognition, evaluation, emotional response and behavior that occurs in a continuous process, and emphasize the mediating role of the emotional experience. It was this theory that formed the framework of the modern CAC. The C-A-C framework integrates three fundamental elements: cognitive processing, emotional response, and behavioral intention, this framework emphasizes that an individual's perception of external stimuli affects the individual's affective state, which in turn drives observable behavior²⁹. Research based on the CAC framework is extensive in contexts such as mobile applications and e-learning platforms. For example, Pang et al.³⁰ explores whether negative network effects cause privacy risks, information overload, and reduced app usage, it shows how such drawbacks shape user decisions. Another study, based on the CAC framework, examines how emotional intelligence (EI) affects online consumers' value perceptions and shopping behaviors³¹. And Kim and Lennon³² found that four dimensions of website quality all have a significant positive impact on emotions, perceived risk has a significant negative impact on consumer emotions, and both perceived risk and emotions have a significant impact on purchase intention. This study verifies that customers' rational perception of a product (e.g., quality) triggers emotional dependence (e.g., trust), which ultimately leads to repeat purchase intention. This suggests that, beyond initial acceptance, users' continuance use intentions may be closely related to the emotional states evoked during use.

Continuance intention is more closely related to users with prior experience, and emotional mechanisms become more important at this stage. Therefore, the CAC framework provides a valuable complementary perspective for explaining continued usage behavior. The research results of CAC framework are rich, but there is still a significant gap in the research on applying it to the users' continuance intention toward online meetings. Specifically, the complete mechanism of how cognitive evaluation in online meeting scenarios ultimately affects users' continuance intention through emotional experience has not been systematically explored.

Study 1

Research design

Study 1 adopted a qualitative research method based on Grounded Theory. The core purpose is to systematically explore and integrate the key factors that affect their continuance intention directly from the real experience of users and provide an empirical basis for the subsequent construction of the CAC framework. The study recruited 17 users who frequently used mainstream online meeting platforms (e.g., Zoom, Tencent Conference, Ding Talk, etc.) for speeches, meetings or other activities in the past six months as interview subjects, including 7 males and

10 females. A semi-structured interview was used. At the end of the interview, all audio data were transcribed to check whether there were any omissions, then text data were coded and analyzed through NVivo 12.

According to the purpose of this study and drawing on relevant research results, the researchers designed a semi-structured interview outline. The interview outline is as follows: ① Do you prefer online or offline meeting? ② What are the advantages and disadvantages of online and offline meeting? ③ What difficulties have you encountered in online and offline meeting? ④ What specific behavioral habits or usage characteristics do you have in online/offline meeting? ⑤ What specific suggestions for improvement or expected help do you have for the online meetings?

Study 1 result

In qualitative research methods, open coding is the core link of data processing, which mainly deconstructs the collected interview texts through a systematic and rigorous analysis process. The researcher first decomposes the initial text data into independent semantic fragments, and gradually extracts the core elements from the discrete data through multiple rounds of comparison and circular testing³³. In other words, the purpose of open coding is to give concepts to the statements collected from the interviewees to form more general preliminary categories. After repeated induction, the categories are formed, this study obtained a total of 32 initial categories (Table 1).

To further analyze the logical relationship, axial coding was employed as the secondary phase to delineate conceptual relationships among categories. As an advanced analysis strategy, axial coding is mainly used to structurally integrate the massive amount of information generated by primary coding. This coding method not only deepens the theoretical explanatory power of the initial coding, but also more effectively solves the problem of conceptual fragmentation in the original data³⁴. Finally, 32 primary categories were integrated into 9 main categories with internal logical relationships (Table 1). F1 information transmission barriers: It refers to information distortion, delay or loss caused by technical or environmental limitations during online communication (e.g., voice interruption, screen freeze); F2 interaction and feedback deficiency: It refers to users perceive insufficient interaction frequency and lack of key feedback in online settings (e.g., limited real-time interaction features, monotonous formats, no warm-up activities) and blocked feedback channels (e.g., unanswered questions, blurred emoticon feedback); F3 negative social presence: It refers to users feel ignored, isolated, or unable to communicate effectively in digital interactions (e.g., low participation); F4 technical

Main category	Initial category	Definition
F1 Information transmission barriers	C1 Concerns about information transmission C2 Information reception blocking	It refers to information distortion, delay or loss caused by technical or environmental limitations during online communication (e.g., voice interruption, screen freeze)
F2 Interaction and feedback deficiency	C3 Less interaction C4 Interaction delay C5 Less warm-up C6 Less feedback C7 Feedback delay C8 Nonverbal feedback is ambiguous C9 Low communication efficiency	It refers to users perceive insufficient interaction frequency and lack of key feedback in online settings (e.g., limited real-time interaction features, monotonous formats, no warm-up activities) and blocked feedback channels (e.g., unanswered questions, blurred emoticon feedback)
F3 Negative social presence	C10 Low participation C11 Weak sense of ritual C12 Weak sense of coexistence C13 Weak sense of team C14 Weak immersion C15 Weak sense of reality C16 Low social support	It refers to users feel ignored, isolated, or unable to communicate effectively in digital interactions, (e.g., low participation)
F4 Technical disadvantages	C17 Voice quality C18 Network delay C19 Reliance on visual search C20 Audio source confusion	It refers to shortcomings of online meeting platforms' technical support (e.g., network lag and screen freezing)
F5 Attention distraction	C21 Distraction C22 Boredom	It refers to multitasking environments or cognitive overload that causes users to disengage from the presentation content (e.g., perceived boredom)
F6 Self-efficacy	C23 Sense of control C24 Confidence	It refers to users' confidence in completing online presentations developed through their own experience
F7 Technical advantages	C25 Privacy protection C26 Self-hiding C27 Social avoidance C28 Break through space limitations	It refers to efficiency gains and experience improvements from platform features (e.g., privacy protection)
F8 Positive emotional experience	C29 Sense of freedom C30 Sense of relaxed	It refers to positive emotional state triggered by good user experiences during the use of the platform (e.g., users feel greater freedom)
F9 Stress- reducing virtual perception	C31 perceived social presence C32 perceived informality	It refers to the virtual characteristics of the online environment (e.g., virtual images and virtual physical distance) can reduce the user's social anxiety and improve the user's psychological comfort

Table 1. Results of study 1 (Grounded-theory coding). Categories were generated through open coding and subsequently integrated via axial coding (N=17 interviews).

disadvantages: It refers to shortcomings of online meeting platforms' technical support (e.g., network lag and freezing); F5 attention distraction: It refers to multitasking environments or cognitive overload that causes users to disengage from the presentation content (e.g., perceived boredom); F6 self-efficacy: It refers to users' confidence in completing online presentations based on past experience; F7 technical advantages: It refers to efficiency gains and experience improvements from platform features (e.g., privacy protection); F8 positive emotional experience: It refers to positive emotional state triggered by good user experiences during the use of the platform (e.g., users feel greater freedom); F9 stress-reducing virtual perception: It refers to the virtual characteristics of the online environment (e.g., virtual images and virtual physical distance) can reduce the user's social anxiety and improve the user's psychological comfort.

Data saturation means that when new data no longer brings new insights or theoretical concepts, data collection needs not continue³⁵. In this study, two coders independently analyzed the interview transcripts, engaging in multiple rounds of discussion to resolve discrepancies and refine categories. The three pre-reserved interviews were analyzed following the coding steps described above, and no new concepts or categories emerged from the analyses, which shows that the theory has reached saturation.

In summary, through the rigorous coding analysis of Grounded Theory, this study systematically identified and presented the key factors that influence the continuance intention of online meetings from users' original interview data. These factors not only cover the user's cognitive evaluation of the platform's functions, but also reveal the emotional experience and individual characteristics accompanying the use process. The theoretical saturation test confirmed the completeness of the category system and provided a solid theoretical guarantee for the subsequent verification of the complex dynamic influence mechanism among various factors.

Study 2

Construction of structural equation model based on CAC framework

Based on the CAC framework, this study integrates the nine influencing factors obtained through interviews and coding into two core dimensions: cognitive dimension (negative cognition and positive cognition) and emotional dimension (negative emotion and positive emotion) to deepen the understanding of the users' continuance intention of the online meetings. Negative cognition includes four sub-dimensions: Information Transmission Barriers (IT), Interaction and Feedback Deficiency (IF), Technical Disadvantages (TD), and Attention Distraction (AD). These factors together reflect negative user perceptions of the online environment's dysfunction and lack of interaction and feedback. Positive cognition covers two sub-dimensions: Technical Advantages (TA) and Stress-Reducing Virtual Perception (SV), which concentrate on users' positive cognition of platform technology and the feelings they get during use. These are consistent with the cognitive definition of CAC, which is an individual's rational understanding and belief about a thing or situation, including the perception and evaluation of its attributes, functions, and value.

The emotional dimension includes Negative Social Presence (NS) and Positive Emotional Experience (PE). The former refers to the loneliness and alienation caused by the lack of social cues, while the latter emphasizes the user's good emotional perception of the platform. These are consistent with the definition of emotion in CAC, that is, individual emotional reactions and emotional experiences triggered by cognitive evaluation. It should be noted that the user's personal characteristics, self-efficacy (SE), will be introduced into the model as a moderating variable, which emphasizes the user's relatively stable inherent traits.

Finally, through the integration of factors in each dimension, the key factors of the structural equation model are clarified to provide a theoretical basis for the subsequent empirical tests.

Research hypotheses

Schachter and Singer³⁶ and others have suggested that cognitive factors may be the primary determinants of emotion. It advocates that emotions arise from the evaluation of stimulus situations or things. Arnold is another psychologist who posits that cognitive appraisals represent the critical determinants of emotion, her theory further points out that cognitive evaluation produces a felt tendency toward or away from the emotional stimulus and specific bodily changes³⁷. In short, most studies believe that cognition is the premise and basis for the generation of emotions and feelings. The classic study by Smith and Ellsworth³⁸ provides a detailed analysis of how negative cognitive appraisal patterns are associated with specific negative emotions.

In a study on virtual communities, Ning Shen and Khalifa³⁹ treated social presence as an emotional experience variable and examined its impact on user satisfaction and continuance intention. In addition, Skalski and Tamborini⁴⁰ found that participants who wanted to get health information perceived a higher level of social presence compared to participants who did not have the chance to get health information. Horzum⁴¹ demonstrated that online social presence of students was predicted positively by interaction. Skalski and Whitbred⁴² showed that the high audio-quality participants felt higher levels of social richness than their low audio-quality counterparts. Oh et al.⁴³ indicated that real-world distractions (a ringing cell phone) had a negative effect on social presence. These studies reveal that information transmission, interaction and feedback, technological advantages, and attention can all influence social presence.

We can speculate that negative cognition is related to negative social presence, which may be because negative cognition directly affects users' negative evaluation of social presence by triggering the emotional level of "loss of control" or "powerlessness". It can be inferred that negative cognition will become a positive predictor of negative social presence. Hence, this study hypothesizes:

H1 Information transfer barriers positively affect negative social presence.

H2 Interaction and feedback deficiency significantly affect negative social presence.

H3 Technical disadvantages have a positive impact on negative social presence.

H4 Attention distraction is positively associated with negative social presence.

Cognition is the basis of emotions. Lazarus⁴⁴ proposed a core theory that emotions are driven by cognitive evaluation and pointed out that positive cognitive evaluation will lead to the generation of positive emotions. Mak et al.⁴⁵ emphasized the positive cognitions are key factors to promote well-being. In a study, mindfulness is proposed to introduce flexibility in the generation of cognitive appraisals by enhancing interoceptive attention, it facilitates reappraisal of adversity and gain new emotional experiences⁴⁶.

These studies reveal the role of positive cognition in shaping emotions. Positive cognition will be a positive predictor of positive emotional experience. Therefore, we hypothesize:

H5 Technical advantages positively influence positive emotional experience.

H6 Stress-reducing virtual perception significantly enhances positive emotional experience.

Negative social presence is a type of negative emotional perception. Weiner⁴⁷ pointed out that certain negative emotions can reduce an individual's motivation and willingness to engage in specific behavior. Jing Zhang et al.⁴⁸ demonstrated the stronger the consumer's social presence, the stronger the stickiness to the shopping platform. Zhou et al.⁴⁹ found that when a technological experience generates negative emotions, it can inhibit users' continuance usage.

Many studies have shown that high social presence can promote trust, cooperation and emotional connection, and enhance user stickiness; conversely, low social presence will weaken user sense of belonging and leads to decreased engagement. Thus, this study hypothesizes:

H7 Negative social presence negatively affects users' continuance intention.

Bagozzi et al.⁵⁰ demonstrated the impact of positive emotions on behavioral intention. Positive emotional experience strengthens users' positive evaluation of products by enhancing their emotional attachment and satisfaction with products, forming an "emotional memory anchor", just like users feel happy because of the smooth experience on the shopping platform, which increases the possibility of subsequent purchases. Makkonen et al.⁵¹ found positive emotions to have stronger effects in comparison to negative emotions, positive emotions affect repurchase and recommendation intentions not only indirectly via satisfaction but also directly. Therefore, this study posits that:

H8 Positive emotional experience positively affects users' continuance intention.

Self-efficacy is a construct that focuses on an individual's evaluation of their capacity to do something successfully in a special situation. It is related to an individual's confidence in his or her ability to complete a specific task²⁰. According to Social Cognitive Theory⁵², self-efficacy is an important core influencing factor between behavioral intention and actual behavior.

Self-efficacy may influence the negative impact of negative social presence in certain situations. Atabay⁵³ research results show that students with a strong sense of self-efficacy have high expectations for the future. When the actual experience falls short of these expectations, dissatisfaction becomes more intense and affects continued use intention. For example, Previous research found that users' unrealistically high expectation for quality services is one of the key reason of their dissatisfaction⁵⁴. In addition, High self-efficacy users have stronger emotional regulation ability and pay more attention to functional utility rather than emotional experience, which leads to a reduction in the driving effect of positive emotions, and may be resistant to emotional dependence, thus weakening the impact of emotional experience. One study showed that individuals with better emotion regulation skills had higher self-efficacy scores⁵⁵. Accordingly, this study proposes that self-efficacy moderates the effects of both negative social presence and positive emotional experience on continuance intention. So this study hypothesizes:

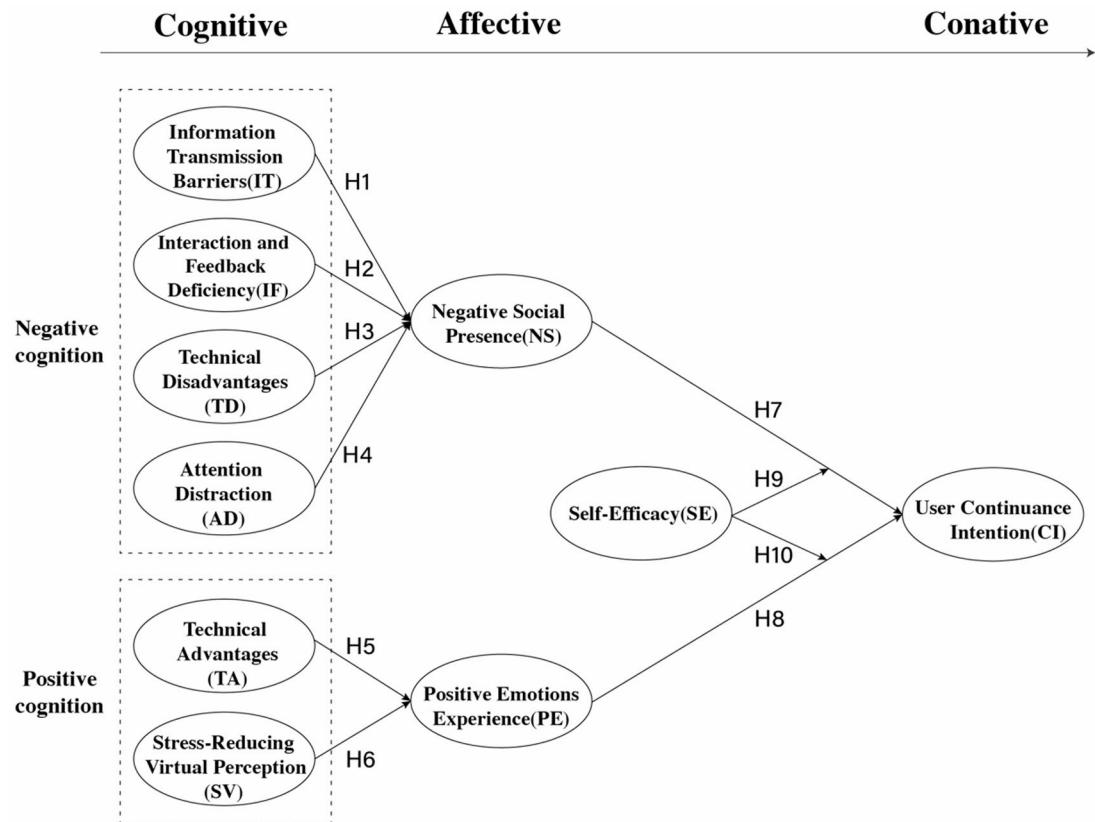
H9 Self-efficacy moderates the relationship between negative social presence and users' continuance intention.

H10 Self-efficacy moderates the relationship between positive emotional experience and users' continuance intention.

Based on the above assumptions, the model hypothesized of the study is shown in Fig. 1.

Methodology

Data for this study were collected using a questionnaire survey method. Participants in this study were required to have both online and offline meeting experience. The samples were collected using a convenience sampling method from various regions across mainland China through an online questionnaire platform. In the end, 301 participants with online speaking experience filled out the online questionnaire. After deleting questionnaires that took less than 70 s to answer, 292 valid questionnaires remained. There were more female participants (69.52%) than male participants (30.48%), and people aged 18–29 accounted for the vast majority (92.47%) (Table 2).

**Fig. 1.** The research model.

		Number	Percentage (%)
Gender	Female	203	69.52
	Male	89	30.48
Age	18–29	270	92.47
	30–39	20	6.85
	40–49	2	0.68

Table 2. Demographic of participants.

To ensure the scientific rigor and reliability of the questionnaire development, this study strictly followed the ten-step method summarized by Carpenter⁵⁶, implementing procedures such as item screening and validity and reliability testing, thereby enhancing the content validity and construct validity of the questionnaire. The questionnaire consists of two parts. The first part is personnel statistics, which mainly collects basic information, such as age and gender. The second part of the questionnaire is the item scale, which mainly measures the respondents' attitudes, perceptions, and usage of online meetings. In this part, we measured each factor using the Likert 5-point scale. Each construct was designed with 3 to 5 measurement items. Respondents were asked to choose one of "Strongly Disagree" "Disagree" "Neutral" "Agree" "Strongly Agree" to express their level of agreement with the item, and the values were assigned from 1 to 5 for statistical analysis.

Study 2 results

Reliability and validity tests

This study used the statistical analysis software SPSS 27 and the structural equation model analysis software AMOS 24 to analyze the data collected from the survey. The reliability analysis of the measurement model is mainly used to detect the internal stability and consistency of the questionnaire scale, and the Cronbach's α and composite reliability (CR) values are used for judgment. All Cronbach's α are greater than 0.7, and the CR value are all > 0.7 , which indicates good reliability (Table 3).

Validity analysis was conducted to examine the structural validity of the measurement scales, and the KMO test and Bartlett's test in the factor analysis method in SPSS software are utilized to test the correlation between the items. When testing the validity with factor analysis, the prerequisite of factor analysis needs to be satisfied

Measurement variable	Latent variable	Cronbach's alpha	Factor loadings	AVE	CR
IT4	F1 Information transmission barriers	0.834	0.775	0.562	0.836
IT3			0.782		
IT2			0.751		
IT1			0.686		
IF4	F2 Interaction and feedback deficiency	0.861	0.722	0.615	0.864
IF3			0.829		
IF2			0.756		
IF1			0.825		
NS3	F3 Negative social presence	0.825	0.723	0.611	0.825
NS2			0.794		
NS1			0.825		
TD4	F4 Technical disadvantages	0.872	0.774	0.638	0.876
TD3			0.856		
TD2			0.758		
TD1			0.804		
AD4	F5 Attention distraction	0.913	0.854	0.726	0.914
AD3			0.840		
AD2			0.865		
AD1			0.848		
SE3	F6 Self-efficacy	0.759	0.740	0.520	0.765
SE2			0.703		
SE1			0.720		
TA5	F7 Technical advantages	0.772	0.620	0.412	0.777
TA4			0.747		
TA3			0.636		
TA2			0.620		
TA1			0.574		
PE3	F8 Positive emotions experience	0.7	0.693	0.441	0.703
PE2			0.652		
PE1			0.647		
SV3	F9 Stress-reducing virtual perception	0.773	0.781	0.540	0.779
SV2			0.683		
SV1			0.738		
CI3	User continuance intention	0.760	0.774	0.527	0.769
CI2			0.669		
CI1			0.730		

Table 3. Construct validity and reliability test results.

firstly, that is, there is a strong correlation between the items. The results of the study show that the KMO statistic value is 0.912, the data is very suitable for factor analysis; the result of Bartlett's test is 0.0 ($p < 0.05$), the spherical hypothesis is rejected and there is a correlation between the original variables, which makes it suitable for factor analysis. It indicates that the questionnaire has structural validity.

The study assessed the validity of the scale by referring to the scale development and validation recommendations of DeVellis and Thorpe⁵⁷. To evaluate convergent validity, we examined both the average variance extracted (AVE) and the factor loadings. All the factor loading values are greater than the threshold value 0.5, and amongst the dimensions' AVE values > 0.5 , while the AVE values of F7 and F8 are slightly < 0.5 but > 0.4 , and their factor loadings > 0.50 , Cronbach's α values > 0.70 , and CR values > 0.70 . Therefore, the convergent validity can still be considered acceptable by O'Leary-Kelly and Vokurka⁵⁸ (Table 3).

Discriminant validity was assessed using the Fornell-Larcker criterion⁵⁹. From the discriminant validity matrix of the table, it can be found (Table 4) that the square root of the AVE values of each latent variable exceeds other variables' correlation coefficients, which also indicates that the scale has good discriminant validity.

Structural equation model testing

As shown in Table 5, χ^2/df ratio = 1.585, RMSEA = 0.045, CFI = 0.946, TLI = 0.940, ILI = 0.947. All values meet recommended thresholds (CFI/TLI/ILI > 0.90 ; RMSEA < 0.08 ; $\chi^2/df < 3$), This indicates that the model fit standard.

The results of hypotheses test

The results of hypothesis testing are shown in (Table 6) and (Fig. 2). When testing, we found that the interaction and feedback deficiency factor positively affects the negative social presence ($\beta = 0.58, p < 0.001$), supporting H2. the attention distraction factor positively affects the negative social presence ($\beta = 0.292, p < 0.001$), supporting H4. The Technical advantages positively affect the positive emotional experience ($\beta = 0.226, p < 0.05$), thus Support H5. Stress-reducing virtual perception positively influences positive emotional experience ($\beta = 0.705, p < 0.001$), Support H6. Negative social presence negatively influences users' continuance intention ($\beta = -0.164, p < 0.01$), Support H7. Positive emotional experience positively influences users' continuance intention ($\beta = 0.791, p < 0.001$), Support H8.

	IT	IF	NS	TD	AD	SE	TA	PE	SV	CI
IT	0.75									
IF	0.604	0.784								
NS	0.591	0.765	0.782							
TD	0.516	0.586	0.627	0.799						
AD	0.522	0.692	0.734	0.624	0.852					
SE	-0.17	-0.292	-0.306	-0.227	-0.361	0.721				
TA	-0.03	0.053	0.073	0.07	0.023	0.397	0.642			
PE	-0.113	-0.174	-0.174	-0.142	-0.197	0.552	0.498	0.664		
SV	-0.122	-0.123	-0.156	-0.121	-0.123	0.461	0.511	0.614	0.735	
CI	-0.124	-0.232	-0.234	-0.136	-0.227	0.522	0.46	0.593	0.535	0.726

Table 4. Discriminate validity of the research model. The bold diagonal values represent the square roots of the average variance extracted (AVE). IT, information transmission barriers; IF, interaction and feedback deficiency; TD, technical disadvantages; AD, attention distraction; TA, technical advantages; SV, stress-reducing virtual perception; NS, negative social presence; PE, positive emotional experience; SE, self-efficacy; CI, user continuance intention.

Model fit index	Chi-square/df	RMSEA	CFI	TLI	ILI
Model fit summary	1.585	0.045	0.946	0.940	0.947
Recommended values	<3	<0.05	>0.90	>0.90	>0.90

Table 5. Fit indices of the structural model.

Hypothesis	Path	B	β	S.E	C.R	P	Result
H1	IT→NS	0.042	0.047	0.057	0.728	0.466	Rejected
H2	IF→NS	0.564	0.58	0.094	6.008	<0.001	Supported
H3	TD→NS	0.101	0.108	0.059	1.706	0.087	Rejected
H4	AD→NS	0.241	0.292	0.064	3.748	<0.001	Supported
H5	TA→PE	0.231	0.226	0.091	2.546	0.011	Supported
H6	SV→PE	0.627	0.705	0.093	6.735	<0.001	Supported
H7	NS→CI	-0.119	-0.164	0.040	-2.953	0.003	Supported
H8	PE→CI	0.900	0.791	0.099	9.109	<0.001	Supported

Table 6. The results hypotheses test. IT, information transmission barriers; IF, interaction and feedback deficiency; TD, technical disadvantages; AD, attention distraction; TA technical advantages; SV, stress-reducing virtual perception; NS, negative social presence; PE, positive emotional experience; CI, user continuance intention.

The results of the moderating effect

The moderating effect was assessed using the Bootstrap method (5000 resamples, 95% confidence interval) through the Process 4.1 program. The moderating effects of self-efficacy were examined separately between negative social presence, positive emotional experience, and users' continuance intention (Table 7). The results showed that the interaction term between self-efficacy and negative social presence is significant ($p < 0.01$), the coefficient of the interaction term is -0.1205, with a 95% confidence interval [-0.2106, -0.0303], which does not include 0, meaning that hypothesis H9 is established. The interaction term between self-efficacy and positive emotional presence is not significant, that is, the moderating effect is not significant, so hypothesis H10 is not established.

To better understand the moderating effect of self-efficacy on negative social presence and users' continuance intention, simple slope plots were produced (Fig. 3). The moderating effect of self-efficacy was not significant at low levels but became significant at high levels, negatively influencing the impact of negative social presence on users' continuance intention. In other words, it enhances the impact of negative social presence on users' continuance intention.

In summary, the results of Study 2 clearly reveal the complex psychological mechanism of users' continuance intention about online meetings, empirically support the core chain path of the "cognitive-affective-conative" framework. The study not only verifies core hypotheses, but more importantly, systematically elucidates the cognitive evaluation triggers, affective mediation mechanism, and individual trait that affect users' long-term stickiness, which provides a precise intervention direction for platform optimization.

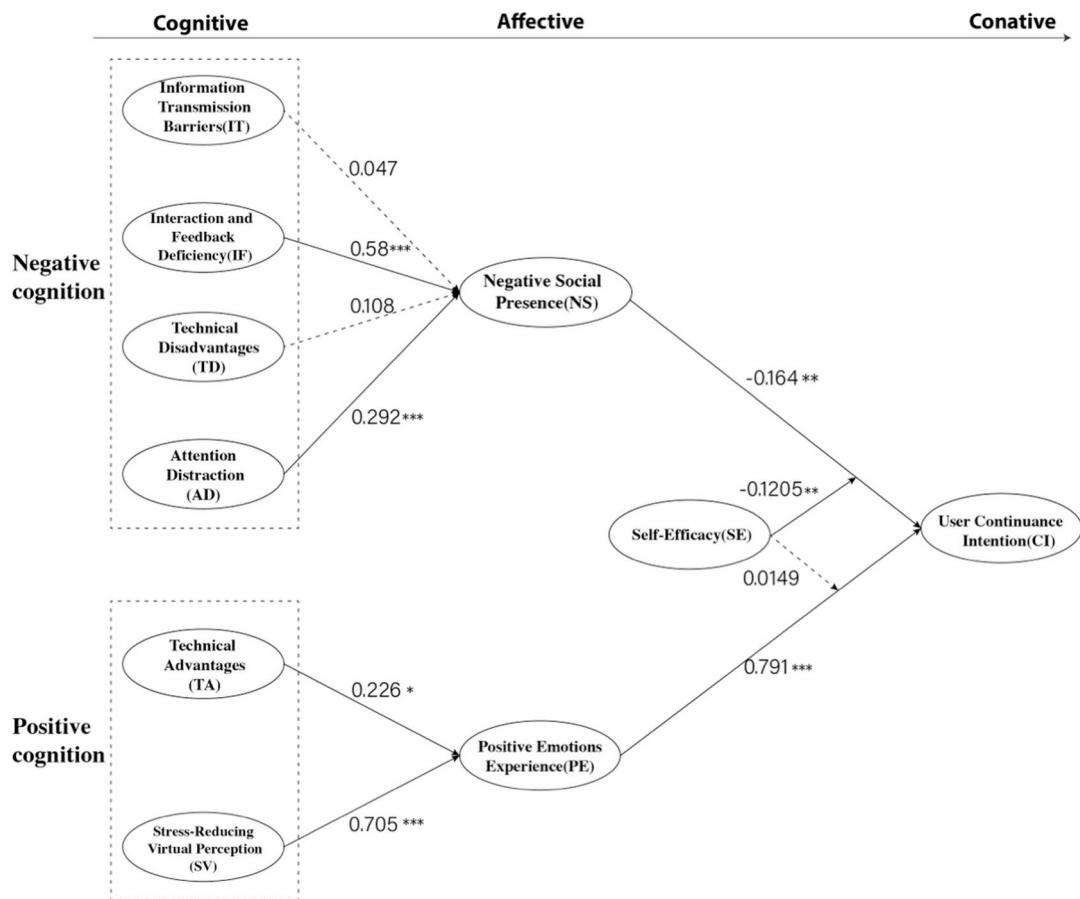


Fig. 2. Structural equation modeling results. Note Dashed lines indicate non-significant effects. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

		B	S.E	t	P	95% CI
Model 1	NS	-0.0175	0.0377	-0.4640	0.6430	-0.0917 0.0567
	SE	0.4813	0.0486	9.9074	<0.001	0.3857 0.5769
	NS*SE	-0.1205	0.0458	-2.6303	0.0090	-0.2106 -0.0303
	R ²			0.2958		
	F			40.3206		
Model 2	PE	0.4684	0.0622	7.5274	<0.001	0.3459 0.5909
	SE	0.2491	0.0483	5.1350	<0.001	0.1539 0.3442
	PE*SE	0.0149	0.0494	0.3007	0.7639	-0.0825 0.1122
	R ²			0.4067		
	F			65.7982		

Table 7. Bootstrap moderation analysis. Note NS, negative social presence; SE, self-efficacy; PE, positive emotional experience.

Discussion

Negative cognition significantly affects negative social presence

Data analysis shows that users' negative perceptions of online meetings (interaction and feedback deficiency, $\beta = 0.58^{***}$; attention distraction, $\beta = 0.292^{***}$) significantly and positively affect their negative social presence. Specifically, when users develop negative perceptions of the platform, their sense of awkwardness and isolation in online interactions increases significantly. This finding is consistent with the conclusions of O'Leary et al.⁶⁰ study on subjective social status perceptions influencing negative affect. It is worth noting that the influence of information transmission barriers and technological disadvantages did not significantly affect users' negative social presence as assumed, this may be due to the maturity of online technology, and users have formed psychological expectations and coping strategies for information transmission barriers (such as using text chat to

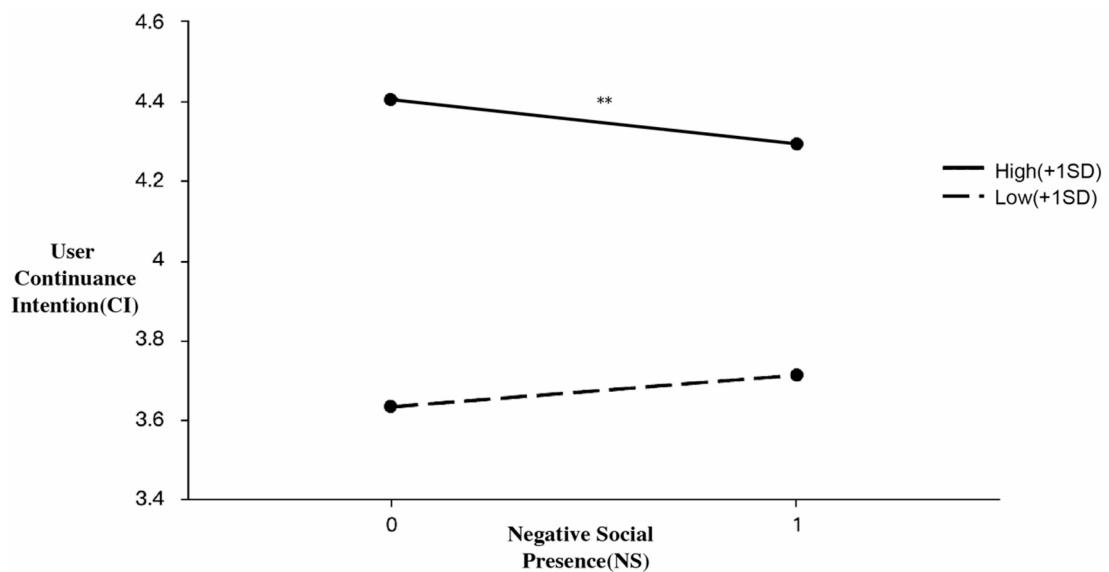


Fig. 3. Simple slope plots.

supplement information). Therefore, mild information transmission barriers do not necessarily directly translate into strong feelings of isolation or embarrassment. At the same time, users may blame the platform rather than their social partners for the technical defects, thereby reducing the impact on their perceived social presence, which shows that users' negative social presence mostly comes from direct interaction experience and feedback experience, and they are not overly concerned about information transmission barriers or technical defects. Future research needs to further explore how to optimize the interactive characteristics of the platform and reduce distractions through technology, thereby reducing feelings of isolation in online meeting environments and minimizing their adverse effects on user retention.

Positive cognition significantly affects positive emotional experience

Users' positive cognition of online meetings (e.g., technical advantages, $\beta = 0.226^*$; stress-reducing virtual perception, $\beta = 0.705^{***}$) significantly and positively affects their positive emotional experience. Specifically, when users perceive that the platform has efficient technical support (e.g., privacy protection, social avoidance, and convenience across time and space) or experience a highly immersive virtual environment and the relaxation brought by an unreal environment, their positive emotions (e.g., pleasure and sense of accomplishment during use) are significantly enhanced. This finding is consistent with the research conclusion of Huang and Han⁶¹, symptoms of social anxiety were significantly improved by using the online virtual environment. It means users' positive cognition of platform functions can directly strengthen their positive emotional identification.

In addition, the impact of stress-reducing virtual perception is far higher than that of technical advantages, indicating that users are more concerned about the actual feelings brought by the virtual characteristics of the platform. This is probably because the immersive virtual experience reduces the tense atmosphere of meeting presentations or weakens their sensitivity to social pressure, so users get a better experience. This should also be related to the fact that the perception of the virtual environment affects the user experience. Therefore, future research can further explore how to optimize users' virtual experience through technological iteration, create a more relaxed social atmosphere, or use the advantages of online technology to relieve users' tension to maximize the positive emotional motivation effect.

Negative social presence significantly reduces users' continuance intention

Users' negative social presence on online meeting platforms ($\beta = -0.164^{***}$) significantly negatively affects their continuance intention. Specifically, when users perceive embarrassment, isolation, or social pressure in online interaction, their continued use intention is significantly reduced. Research by Jin and Youn⁶² found that social presence can be positive predictors of AI-chatbot continuance intention. The research results of Zhang et al.⁶³ also revealed the impact of social presence on learning satisfaction and persistence in online learning environments. All these prove that social presence is closely related to users' continuance intention. In other words, discomfort in the social environment will directly weaken users' long-term dependence on the platform. Therefore, the impact of social presence cannot be ignored. Future research needs to further explore how to enhance user connections and relieve users' social pressure by optimizing social interaction design. At the same time, through technical assistance, it enhances users' sense of social support, balancing the dual needs of technical performance and social experience.

Positive emotional experience significantly increases users' continuance intention

The user's positive emotional experience of the online meetings ($\beta = 0.791^{***}$) significantly positively affects their continuance intention. Specifically, when the user experiences pleasure or relaxation during use, their continuance intention is significantly enhanced. This finding is consistent with the research conclusion of Xiao-yuan Wang et al.⁶⁴ on the prediction of offline young customer loyalty by positive emotions. Good online meeting experience can help reduce social anxiety, increase positive emotions, and promote users' behavioral intentions.

In the emotional dimension, the impact of positive emotional experience ($\beta = 0.791^{***}$) far exceeds the negative social presence ($\beta = -0.164^{***}$), indicating that positive emotional factors are the core driving force of user retention. In summary, positive emotional experience is the key to enhance continued use intention. Therefore, in subsequent research, we will focus on using the platform's technical advantages to create a more relaxed and pleasant atmosphere in online meetings, and further amplify the role of users' positive emotional experience in promoting behavioral intention.

The moderating effect of self-efficacy: negative social presence affects users' continuance intention

Users' negative social presence significantly negatively affects their continuance intention, while self-efficacy ($\beta = -0.1209^{**}$) plays a significant moderating role in this relationship, and the moderating effect of self-efficacy strengthens the impact of negative social presence on continued use intention at a high level. Specifically, when self-efficacy is at a high level, the negative predictive effect of negative social presence on continued use intention is further enhanced. Although this is different from the positive effect of self-efficacy in some studies. For example, Ramadania and Braridwan⁶⁵ reported that students' behavioral intentions towards the continuous use of mobile learning are significantly influenced by self-efficacy. This may be because, at the same negative level of social presence, high self-efficacy users are more likely to attribute problems to the platform (for example, the poor platform experience reduces the sense of connection between meeting participants, leading to dissatisfaction with the platform) rather than their own lack of ability, thereby reducing their willingness to use. Chen⁶⁶ indicated that customers with high self-efficacy attribute more responsibility to the platform for a service failure as their participation in service increases.

In general, higher self-efficacy can help users achieve their goals better, but in this study, high self-efficacy exacerbated the negative impact of social presence. This indicates that users with higher self-efficacy are more sensitive to social cues and tend to experience a stronger decline in continuance intention. Therefore, in the subsequent improved design, functional division can be made based on user personal characteristics, such as considering the differences in user characteristics and exploring ways to alleviate the negative social presence of users to reduce the negative effect of high self-efficacy.

Implications

Theoretical implications

This study verifies the complete chain mechanism of the Cognitive–Affective–Conative (CAC) framework. Particularly in the context of online meetings, the affective path (especially positive emotions) is a key perspective for explaining user retention. This study employs the Cognitive–Affective–Conative (CAC) framework, which is particularly well-suited for continuance contexts because it explains how users' cognitive and emotional experiences after adopting a platform influence their continuance intention. At the same time, this study systematically subdivides users' cognitive factors, distinguishing between positive cognitive factors (e.g., technical advantages, stress-reducing virtual perception) and negative cognitive factors (e.g., interaction and feedback deficiency, attention distraction). Within the same theoretical framework, it examines the mechanisms by which these two types of cognition respectively influence the paths toward positive emotional experience and negative social presence. This classification method constructs a diversified and detailed cognitive dimension, providing a more refined theoretical basis for explaining how cognition shapes affect and subsequently drives continuance intention.

Methodological implications

This study does not apply qualitative and quantitative methods in isolation; instead, it integrates Grounded Theory and covariance-based structural equation modeling (CB-SEM) in a sequential and complementary manner. This integrated design has both methodological and theoretical value. First, the Grounded Theory phase allowed the theory to emerge directly from users' real experiences, revealing cognitive and emotional factors in specific contexts that might be overlooked or misrepresented if the research were based solely on existing theories. Second, the structural equation modeling phase validated these inductively derived constructs. This process not only enhanced the robustness of the theoretical generalizations but also demonstrated how these naturally generated constructs could be rigorously tested within a given theoretical framework.

In sum, by combining exploratory theory development with confirmatory analysis, this study establishes a systematic pathway for advancing continuance-intention theory and offers a replicable research paradigm for future information systems studies seeking to connect users' actual experiences.

Practical implications

This study's findings not only theoretically enrich the research on user continuance intention but also provide practical insights for the design and optimization of online meeting platforms. First, the results indicate that positive emotional experiences are the core driving force in promoting users' continuance intention. Platforms providers should prioritize mechanisms that foster psychological comfort and reduce social pressure during online interactions. This may include simplifying interaction flow, reducing cognitive load, and offering options that help users remain relaxed and in control during meetings. Second, negative social presence significantly

weakens continuance intention. Therefore, platform providers should enhance users' sense of social connection and presence in online interactions. This can be achieved through mechanisms such as optimizing interactive visibility and strengthening confirmation signals, thereby reducing users' feelings of isolation and increasing their engagement. Third, due to the impact of self-efficacy on negative social presence and continuance intention. Therefore, platform providers should be attentive to user differences when shaping social interaction environments, aim to minimize negative social presence experiences to support sustained use among diverse users.

Overall, the results offer actionable guidance for platform managers seeking to improve user retention by focusing on affect-supportive design, enriched interaction feedback, and differentiated experience pathways for users.

Limitations and future research

This study has the following limitations: First, the participants are mainly young people, the age distribution of the sample is limited, and the proportion of female participants in the questionnaire survey is relatively high. It is impossible to fully measure the objective data of all users and is not universal. Second, the study adopts a cross-sectional design, which limits the study to capture users' behavioral and psychological changes over time. As a result, the relationships among variables could not be firmly established, it can also lead to bias in the research results.

Future research should conduct multi-age user segmentation (e.g., youth, middle-aged, and elderly group analysis), balance the gender ratio when sampling, and deeply explore the impact of age and gender on user experience and users' continuance intention. Second, data collection mainly relies on self-reported interviews and questionnaires but lacks continuous tracking of users' actual platform usage behavior (e.g., usage logs). Future research can integrate multiple methods, such as platform log analysis and physiological data measurement to more comprehensively capture users' real behavior and dynamic psychological changes. In addition, subsequent research could consider adopting experimental designs or longitudinal tracking could help identify causal relationships and temporal dynamics in users' continuance intention. A/B testing different interface or interaction designs, combined with logging and self-reported data, could provide more robust and actionable insights for optimizing online meeting design.

Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

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Author contributions

JX.W. : Conceptualization; Theory presentation; Methodology; Questionnaire design; Investigation ; Data cu-

ration; Formal analysis; Writing—original draft; Visualization; Project administration; Funding acquisition.S.R.: Supervision; Conceptualization; Investigation; Formal analysis; Writing—original draft; Writing—review & editing; Project administration. All authors reviewed the manuscript.

Declarations

Competing interests

The authors declare no competing interests.

Ethics approval and consent to participate

The study was reviewed and approved by the Research Ethics Committee of the Center for Frontier Medical Engineering, Chiba University. And all experimental protocols have been approved by the licensing board. In line with the Declaration of Helsinki, Informed consent was collected from participants in the study.

Informed consent

This study obtained the informed consent of all subjects and/or their legal guardians.

Additional information

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