

Research on Consumer Purchase Intention of Different Social Presence in Live Broadcast based on GLS Structural Equation Mode

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Keywords: Live Broadcast Marketing, Structural Equation Model, Warm Presence, Quasi-Social Interaction.

Abstract: The development of enterprise information technology provides more ways and means for enterprises to carry out marketing management, and the development of live broadcast information technology provides more ways and supports for customers to participate in enterprise consumption. The development of webcasting technology can display commodities in multiple directions, providing a good idea for the e-commerce circulation industry. This paper adopts the quasi-social interaction theory, collects data through questionnaires, on-site interviews and tracking sales records in the live broadcast of enterprises, analyzes the collected data based on statistical software such as SPSS 23.0 and AMOS 22.0, and uses GLS to build a structural equation model effects and mediation effects. Through empirical analysis, it is found that different presences in e-commerce live broadcasts have a positive impact on customer purchase intention, and the mediating effect of quasi-social interaction is significant. Among them, the dimensions of communication presence and warm presence have an important impact on social interaction, which in turn affects customers. Purchase Intention. On this basis, suggestions are put forward to improve the effect of webcasting.

1 INTRODUCTION

1.1 Background

Since Taobao took the lead in launching an online live broadcast marketing platform positioned as "consumer live broadcast" in 2016, major online e-commerce platforms have successively launched their own online live broadcast services. In the past year, it has become a new bright spot in the growth of online consumption (China Internet Network Information Center, 2019). According to reports, during the "Double Eleven" period in 2019, more than 100,000 merchants opened live broadcasts on Taobao's single platform; in the opening 63 minutes, the transaction volume guided by Taobao's live broadcast has exceeded that of the "Double Eleven" in 2018; % of merchants have gained new growth through live streaming. The combined impact of the outbreak of the new crown epidemic in 2020 and the long holiday has caused a surge in the number of live broadcast users and usage time. According to a research report released by Media Research, from 2019 to 2020, about 43.2% of Chinese consumers expressed their willingness to choose live broadcast

e-commerce for online shopping; compared with other e-commerce models, live broadcast e-commerce has a shorter propagation path and higher efficiency with higher advantages, the transaction scale of China's live broadcast e-commerce is expected to reach 916 billion yuan in 2020.

As a medium of instant recording, webcasting can quickly spread images and sounds through various communication technologies, and users rely on instant messages, likes, and gift giving to interact with anchors and audiences, creating a virtual immersive feeling (Chen, Lin, 2018). In the study, scholars use Co-presence (CP) and Social Presence (SP) to describe the degree to which individuals feel the virtual co-presence of others in the online environment (Bulu, 2012) and the interpersonal relationships established virtually. degree of prominence (Short, et al, 1976, Zhang, Chen, 2017). The co-presence and social presence of live webcasts make consumers no longer an "isolated island" isolated from other buyers, but placed in an online shopping situation where others watch and buy together virtually. Following the viewpoints of previous scholars, this paper divides the social presence in webcasting into situational presence, warm presence and communication presence around

the aspects of consumer awareness, emotion and cognition. Existing social psychology and marketing research shows that people's activities are often influenced by the presence of others, such as consumers' attention, the pursuit of commodity variety, and consumption decisions are often influenced by social interactions from family members, friends, salespeople, and even strangers. impact (Chatterjee, et al, 2017, Park, et al, 2017, WHITE and ARGO 2011). Previous research on conformity consumption mainly focused on offline consumption scenarios (Bearden, et al, 1994, Gardner, et al, 2020) and online graphic consumption scenarios (Ying, et al, 2016, Chen, Gao, 2013). In particular, the impact of the exact presence in the context of webcasting on consumers' purchase intention remains to be explored.

1.2 Theory and Literature Review

1.2.1 Definition

Social presence (Social Presence) describes a real perception of people's intimacy, enthusiasm, friendliness or social interaction with others in a virtual environment, that is, the degree to which they perceive that they are in the same space with others (Xie, et al, 2019). By combing domestic and foreign scholars' literature, this study found that many scholars have defined social presence from different research perspectives. This article will expound from four perspectives: media characteristics, co-presence, psychological involvement and behavioral fit.

(1) Based on media characteristics. Communication media can convey rich social cues to users, which can help users gain a sense of social presence. Some scholars who study social presence from the perspective of media characteristics believe that social presence is an attribute of the media itself.

(2) Based on the perspective of co-presence. Co-presence refers to the degree to which a user perceives a space-time coexistence with others. Goffman (1959) believes that social presence is the degree to which users perceive the simultaneous presence of others through the medium, which is a psychological feeling. Although people are currently not in the same location as users who live far away, they can be connected through a certain communication medium and feel each other's existence, and this existence is warm and friendly (Sallnas, et al, 2000).

(3) Based on the perspective of psychological involvement. Psychological involvement means that users feel the efforts of others in the process of

interaction to the extent that they will devote themselves to changing their emotions and mentality due to the emotional state of other users. From a psychological point of view, Mehrabian (Mehrabian, 1967) believes that social presence is the user's perceived closeness, intimacy and immediacy with others. The research of Savicki (Savicki, 2000) defines social presence as the psychological feeling that users perceive the existence of other people, and will produce mutual understanding and consideration. Based on the research background of social e-commerce, Dai Jianping (Dai, 2018) defined social presence as consumers' perception and identification with other consumers in the shopping platform, thus generating a sense of shopping immersion.

(4) Based on the behavioral fit angle. Behavioral fit describes interdependence and interaction, making their own decisions based on the behavior of others, and sometimes generating value co-creation behaviors. Social presence is the degree of interdependence between users and others and will engage in social interactions through multiple channels (Palmer, 1995).

All in all, scholars focus on different angles, and there is no unified definition. Some scholars believe that social presence is an attribute of social media, and social presence is different due to different technologies. Some scholars also emphasize that social presence is the psychological perception of people when they interact with other people. This paper argues that social presence is a combination of technology and psychological perception, including both technical and psychological factors. Technical factors provide support for users to obtain a sense of social presence, but technology is auxiliary and also contains social value, mainly including scene presence and communication presence in the live broadcast room, while psychological perception is mainly warm presence, social presence. The generation of sense is inseparable from the user's psychological perception (Teng, Yan, Yang, 2013). Combined with the live broadcast marketing background, this paper believes that the sense of social presence is the degree of co-existence and significant interpersonal relationship between consumers and the anchor and other consumers in the interaction of the live broadcast platform, and it is the fit with other participants in emotion, cognition and consciousness.

1.2.2 Dimensional Division of Social Presence

By sorting out the research content of the dimension of social presence, it is found that scholars divide social presence into different dimensions based on different research situations, and there are single-dimensional and multi-dimensional perspectives in the current research on social presence. This paper adopts a multi-dimensional perspective of social presence. With the development of Internet technology, the social clues that the media can convey are becoming more and more abundant, and the user's control over the media is continuously strengthened. Single-dimensional social presence cannot well explain the interaction between users and other participants, so many scholars need to conduct multi-dimensional research on social presence based on their own research backgrounds.

Biocca et al. (Biocca, et al, 2001) believed that the two dimensions could not meet the research needs very well, so they divided social presence into consumers' perception of being with others, the degree of psychological involvement between themselves and others, and the degree of their own behavior and others' behavior. The impact of these three dimensions on consumers is a gradual process. Tu (Tu, 2002) divided social presence into social scenes, online communication and interaction based on online education scenarios, and explored the impact of the three on user learning performance. With the advancement of technology and changes in consumers' shopping concepts, the dimensions of social presence are also being improved due to the continuous development of research needs. Later, scholars became very interested in virtual communities. Shen et al. (Shen, et al, 2008) believed that social presence not only includes consumer cognition, but also emotion, and further divided social presence into three dimensions: consciousness, emotion and cognition. Based on the online community scenario, Lu et al. (Lu, et al, 2016) divided social presence into web pages, others, and communication social presence, and it would affect the level of consumer trust. For the research on the platform economy, social presence not only includes scene stimuli but also character stimuli, which can be divided into situation, communication and warm presence. These three dimensions all significantly affect customer loyalty (Li, et al, 2019). Witmer et al. (Witmer, et al, 2005) used exploratory factor analysis to divide the social presence perceived by individuals through various channels into four dimensions: the degree of individual inner involvement, the degree of

individual psychological immersion, the degree of individual sensory fidelity and the degree of interface quality.

All in all, with the continuous development of social technology, in the fields of online education, e-commerce and human-computer interaction, the single-dimensional perspective can no longer meet the research needs. Scholars mostly study the sense of social presence from a multi-dimensional perspective, and multi-dimensional division can be accurately compared. It fully describes the user experience and guides the design of the platform system more effectively. With the explosive development of live broadcast marketing and the improvement of consumers' emotional needs when shopping, social presence has gradually become an important research topic. Combined with the specific live broadcast situation, this paper adopts Li Xuexin et al.'s (Li, 2019) research on the presence of a specific platform economy, and divides the social presence into situational presence, communication presence and warm presence.

1.2.3 Related Research in the Field of Social Presence Live Broadcasting

In the field of online marketing, with the rise of online shopping, research on social presence has been on the rise since the beginning of the 21st century, and has reached a new height with the rise of live streaming and other forms of delivery. The definition of social presence has undergone a series of developments. Scholars Hassanein and Head (Scholars, Head, 2007) believe that social presence refers to the sense of warmth and sociality that consumers feel when they are shopping online due to interacting with others who are online at the same time; Eroglu (Eroglu, 2001) believes that consumers are shopping in online stores. When shopping online, a sense of social presence will naturally arise. This sense of social presence can be used to indicate the extent to which consumers can experience shopping in a physical store when they shop online; in the study of live-streaming shopping marketing, Xie Ying et al. Presence refers to the sense of realism, intimacy and familiarity that comes naturally from the real-time interaction between anchors and consumers, and between consumers and consumers in live broadcast platforms. The closer the connection between consumers, consumers and consumers, as if face-to-face communication, the more significant the interpersonal relationship; The weaker the relationship (Peck, 2016).

2 MATERIALS AND METHODS

2.1 Social Presence in Live Shopping Scenarios

Social presence is a manifestation of people's psychological states, often associated with virtual reality scenarios. In the field of marketing, scholars combine social presence with consumer behavior to conduct research. Shen's research believes that social presence is a network medium that enables customers to perceive the psychological state of the existence of others. Lee's research considers social presence to be a true assessment of the psychological presence of other parties involved. Lu Hongbing's research shows that social presence is associated with the presence and feelings of other participants, an emotional and cognitive fit. However, the research on social presence in the field of marketing has not formed a unified definition. Combined with the interactive relationship between producers and consumers in the platform economy, this study defines social presence in the platform economy as the degree to which customers perceive the existence of other relevant parties during the process of customers using the platform, and it is accompanied by the interaction between customers and other parties. Communication and emotional interaction between the parties involved. In the field of mobile internet marketing, scholars have also conducted research on the dimensions of social presence. Through research on online communities, Lu found that the social presence of online communities consists of web social presence, others' social presence, and communication social presence. composed of three dimensions. Xie Ying et al. analyzed the social presence in live broadcast marketing and believed that the social presence in live broadcast marketing included three dimensions: coexistence presence, communication presence and emotional presence. Based on the previous research results, this study draws on the research results of Xie Ying and Li Xuexin, etc., and divides the social presence under the platform economy into three dimensions: situational presence, communication presence, and warm presence. From the perspectives of consumer awareness, emotion and cognition, the social presence in the platform economy can stimulate customers' happy mood in the process of using the platform through the three dimensions of situation, communication and warmth.

2.2 Social Presence and Consumer Purchase Intention

The theory of social influence shows that when an individual feels the greater the number of other people, the greater the influence on the individual will be. Therefore, in the process of using the platform, the situation displayed by the platform and the positive communication with other relevant parties will have an impact on the customer's feelings and preferences. The purchase behavior of customers in the live broadcast will be affected by the environment, and the purchase intention will continue to increase due to the special preference for a certain product or service, and then the final consumption will be completed. When customers use the platform, if the scene displayed by the platform can effectively stimulate the customer's sense of presence, and the information exchange provided by the platform for customers and related parties can bring customers a warm feeling, it will help to promote customer's purchase behaviour. In summary, the following research hypotheses are put forward:

H1a: Situational presence has a direct and significant impact on consumer purchase intention.

H1b: Communication presence has a direct and significant impact on consumer purchase intention.

H1c: Warm presence has a direct and significant impact on consumers' purchase intention.

2.3 The Mediating Role of Quasi-Social Interaction

The theory of social interaction shows that the customer's favorability and loyalty can be further improved through the interaction between the two parties, thereby reducing information asymmetry. The various aspects of the situation displayed on the platform and the degree of information presentation can be told to the seller through interaction, and the social presence can be given to the customer by giving the customer a sense of presence. More information, and then promote customers to engage in quasi-social interaction with anchors and sellers, thereby increasing their willingness to buy.

Previous academic research has mainly established the antecedent variables of quasi-social interaction from the perspectives of interactive communication and emotional connection. In this context, situational presence acts as a tool support to help customers integrate into the live broadcast scene; communication presence is what customers can perceive. It is the main way to communicate with the anchor; the sense of warmth and presence acts as

emotional support, which is mainly reflected in the way the anchor expresses, the public welfare nature of the products sold in the anchor’s live broadcast room, and the embodiment of corporate social responsibility; Moreover, there are many studies on quasi-social interaction to customer purchase intention. Based on previous studies, the following hypotheses are proposed:

H2a: quasi-social interaction mediates the relationship between situational presence and consumer purchase intention.

H2b: quasi-social interaction mediates the relationship between communicative presence and consumer purchase intention.

H2c: quasi-social interaction mediates the relationship between warm presence and consumer purchase intention.

2.4 Samples and Data

The survey mainly adopts the Internet questionnaire survey method, relying on the professional network survey platform to distribute and collect the formal questionnaires of this study, and a total of 230 samples were received. A total of 32 invalid samples, such as irregular filling, too short time, and highly similar questions and answers, were eliminated to form 198 final valid samples. The effective recovery rate of the survey samples was 86.09%. In the valid sample: 82 males (41.41%) and 116 females (58.59%); in terms of education level, 83 are junior college and below (41.92%), and 61 are bachelor degree (accounting for 58.59%). 30.81%), 54 with a master’s degree or above (accounting for 27.27%); in terms of age distribution, 72 persons under the age of 20 (accounting for 36.36%), 68 persons aged 21-30 (accounting for 34.34%), 37 persons aged 31-40 (18.69%), and 21 people over the age of 40 (10.61%).

2.5 Variables and Measurements

According to the sorting and summary of relevant research literature on social presence in the academic circle, combined with the relevant characteristics of live broadcast scenarios, and on the basis of drawing on mature scales in related researches on social presence and consumer purchase intentions at home and abroad, the research institute compiled this research. Dosage meter. At the same time, in order to ensure the accuracy of the expression of the measurement items, according to the suggestions of relevant marketing experts, the test items of some variables have been revised. All scale variables were

measured using a 5-point Likert scale, where 1 means completely disagree and 5 means completely agree.

The independent variable social presence is divided into three dimensions: scenario, communication and warm presence. For the measurement of social presence in live shopping on the corresponding platform, reference is made to the research of Lv Hongbing and Xie Ying, etc., and the feedback from marketing experts is combined to determine the final scenario. There are three dimensions of presence, communication presence and warm presence. Among them, the situational presence adopts "scenarios where I can feel the contact with people during the use of the platform", "I can perceive the existence of other relevant parties during the use of the platform", and "the other relevant parties can Perceived my presence" three items to measure; communication presence is measured by "I can have a social feeling in the process of using the platform", "I can exchange information with other relevant parties in the process of using the platform" "Two items are used to measure; the sense of warmth and presence is measured by "I can experience a kind of human enthusiasm in the process of using the platform", "It can affect my mood in the process of using the platform", "During the process of using the platform" Other interested parties understand my needs" three items to measure. Quasi-social interaction follows the current mainstream measurement scale. Consumers’ willingness to buy uses "If I want to buy related products, I am more likely to buy them in the live broadcast", "I am willing to buy related products in the live broadcast", "When someone asks me where to buy a product is more appropriate, I will Recommend live shopping", "I will continue to buy products in the live broadcast in the future" and other four items to measure.

3 RESULTS AND DISCUSSION

In this study, AM OS23.0 and SPSS22.0 software were used to measure the reliability and validity of the scale. The internal consistency of the total scale was Cronbach's a value of 0.899, which was in line with the conditions. Sexual analysis, the results are as follows:

Table 1. Reliability analysis results.

Variables	Alpha	Cronbach based on normalization terms	Items
Situational	0.892	0.893	3

presence			
Communication presence	0.901	0.902	2
Warmth presence	0.891	0.891	3
Quasi-social interaction	0.882	0.885	4
purchase intention	0.908	0.908	4

Table 2: Validity analysis results.

KMO and Bartlett's test	
KMO Sampling Suitability Quantity.	.835
Bartlett's sphericity test Approximate chi-square	1605.154
degrees of freedom	66
salience	.000

According to the statistical results in Tables 1 and 2, the reliability and validity of the scale used in this paper meet the requirements. The reliability analysis results of each variable in the model show that the Cronbach's coefficients is greater than 0.8, indicating that the reliability effect is very high; the coefficient of factor analysis results is 0.835 (0.000***), which has good validity.

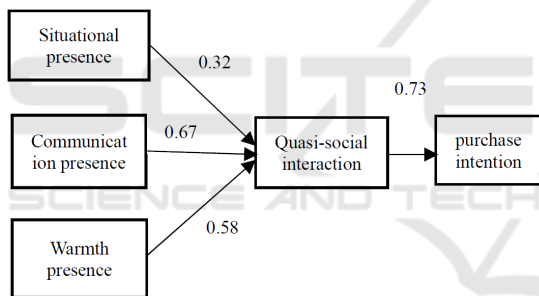


Figure 1: Research Model.

4 CONCLUSIONS

4.1 Research Conclusions

In this paper, generalized least squares analysis of variance (GLS) was used to construct a structural equation model to test the main and mediating effects. As shown in Figure 1, the model includes exogenous variables context, communication and warm presence, endogenous mediator variables quasi-social interaction, and endogenous variables purchase intention. In this paper, Bootstrapping method and coefficient multiplication method are used to verify the mediating effect. The results are shown in the figure: the direct effect of situational presence on social interaction is significant (0.32***), the direct

effect of communication presence on social interaction is significant (0.67**), the direct effect of warm presence on social interaction was significant (0.58***). Among the non-standardized indirect effects, Bias-Corrected 95% confidence interval $0 < \text{Lower} < \text{Upper}$ ($0 < 0.15 < 0.73$) and $z > 1.96$ ($z = 2.76$), that is, the mediating effect exists, and quasi-social interaction act as a partial intermediary.

From the results of the structural model, it can be seen that situational presence, communication presence, and warm presence have a direct and significant impact on social interaction, among which communication presence has the highest correlation with social interaction, which indicates that in live shopping, anchors, sellers appropriate communication with customers can enhance customers' favorability through the intermediary of quasi-social interaction, thereby promoting customer purchases; the correlation coefficient of situational presence aligning with social interaction is only 0.32***, indicating that the corresponding situation in live shopping is very important. The influence of the customer's interaction with the anchor to the final purchase behavior is relatively limited, which may be related to the customer's personal factors, such as different preferences for scenarios. In this case, the company can further investigate the customer's characteristics, such as discounts, promotions and other activities. The impact of warm presence on the society is high, reaching 0.58***, indicating that the willingness to interact between customers and anchors can be further improved through emotional methods. Enterprises can strengthen corresponding emotional methods or launch corporate social responsibility and Caring for the society and other products and services to live broadcast, improve the conversion rate of order purchases.

In a word, the relationship between the communication dimension of social presence and quasi-social interaction is significant, indicating that the presence brought by live broadcast platform communication can maximize customers' purchase intention by strengthening the intermediary form of interaction between buyers and sellers (Burtch et al.,2017). Through emotional means, the customer's willingness to interact and purchase will be improved, and the two feel the quasi-social interaction in the social presence and then have a major impact on the customer's purchase intention.

4.2 Marketing Suggestions

The implications and suggestions for platform companies from this study are as follows:

1. Platform companies attract a large number of users through the "burning money" model for positive network effects. In this process, attention should be paid to the improvement of user experience by social presence. By improving the customer's favorable impression of the platform, the occurrence of multi-attribution of customers is reduced, so as to avoid the reduction of active users of the platform due to frequent changes of platforms by customers, thereby avoiding the generation of negative network effects.

2. The platform company should establish communication and information exchange channels for customers and other relevant parties, so as to facilitate customers to obtain information and reduce the risk of information uncertainty to customers. At the same time, in the process of customers using the platform, platform companies pay attention to the construction of a warm social presence, and should give customers a warm feeling, so that customers can meet their psychological needs while consuming.

3. It is the key goal of platform companies to improve customers' awareness and trust in the platform. As a trading market for customers and product service providers, platform companies are very necessary to ensure the authenticity of the information of customers and product service providers. By establishing a good trust mechanism and taking communication presence as an important social presence, reducing transaction costs and transaction risks caused by information uncertainty in live shopping will help customers to rely on the platform and be able to provide customers' willingness to recommend the platform, thereby contributing to the formation of positive network effects.

4. Effectively improve consumers' sense of social presence, especially for the situation, communication and warm presence in the current situation, mainly around the following points;

(1) enhance consumers' sense of presence in the situation. Situational presence refers to the degree to which consumers can perceive the virtual presence of other people (hosts, product salespeople, and other consumers) while watching a live broadcast. The premise for consumers to perceive the existence of others is to allow consumers to experience a feeling close to the real offline shopping (Lu and Liu et al., 2020). Merchants can enhance consumer awareness and social presence in terms of information display, live broadcast atmosphere and real-time interaction.

(2) enhance consumers' sense of presence in communication. Communication presence is the degree to which consumers perceive that virtual presence of others will have an effect on them, and

can communicate verbally and ideologically with the host. Due to information asymmetry, consumers are often caught in a helpless predicament when shopping online. The premise of Communication social presence is that users in the live broadcast room can provide consumers with purchasing suggestions.

(3) enhance consumers' sense of warmth and presence. Warm presence is the degree to which consumers perceive the emotions and moods of others (anchors, product salespersons, and other consumers) when watching live broadcasts. Today's consumers are not simply for material needs, more and more consumers regard online shopping as a hobby, focusing on social, personal expression and emotional needs. Merchants can improve consumers' emotional social presence from the level of communication style and emotional symbol setting.

4.3 Research Limitations

Based on the relevant research on social presence, which is divided into the dimensions of situational presence, communication presence and warm presence according to the economy of a specific live broadcast platform, this study discusses the influence of social presence on consumers' purchase intention in the process of live broadcast marketing, the specific content includes the direct influence of consumers' purchase intention in various dimensions of social presence, etc. Although this paper follows the scientific and standardization of academic research, the research results obtained have certain contributions in theory and business practice, but due to the influence of subjective and objective conditions, this paper still has the following shortcomings:

(1) The study sample is limited. The sample data in this paper is mainly collected through the distribution of questionnaires on the Internet. Due to resource constraints such as time and financial resources, the sample size is relatively small, making the results of the study relatively unconvincing. The questionnaires are mainly online. Due to time and space constraints, the respondents will have some confusion when filling out the questionnaires, but because they are not around, they cannot solve the questions on the spot, which easily makes the final results of the respondents deviate from the research purpose. Influence the scientific nature of academic research.

(2) Future research should not only focus on empirical research, but should pay attention to diversified research methods, and can carry out case studies, experimental research and other methods; conduct longitudinal research on consumer behavior

in live broadcast rooms, observe dynamic changes in consumer behavior, and enrich the research results.

4.4 Future Research

(1) To explore the emotional mechanism of social presence in the process of live broadcast marketing affecting herd consumption. Although the feeling of warmth and presence focuses on the live broadcast platform and its characteristics to generate an emotional experience, it is essentially the process of consumers' cognition of the live broadcast environment to their emotions. At present, most scholars have actively carried out the cognitive mechanism of the influence of social presence on herd consumption in the process of live broadcast marketing, and investigated the herd consumption behavior of consumers due to the influence of information, but lack of discussion on the emotional mechanism. The presence of others affects our decision-making, often reducing our rational thinking and improving some simple behaviors. In the live broadcast room, consumers make purchase decisions based on the word-of-mouth information of the anchor and other consumers, which are simple task behaviors, while purchasing decisions based on product specifications, materials, and manufacturing processes are complex task behaviors. So far, no research has explored how social presence in live marketing affects herd consumption through consumer emotional mechanisms. Therefore, future research can focus on exploring emotional mechanisms and enrich the theory of social presence.

(2) Subsequent research can refine product categories and explore whether different products have a common psychological mechanism that stimulates purchases to verify the applicability of the model under different categories. In practical applications, there is still a certain intermediary path between social presence and purchase intention. In the follow-up, we can continue to explore consumer psychology from psychological intervention, so as to help anchors mobilize consumers' sense of participation and improve the conversion rate of purchase orders.

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