Article

Effect of Social Presence toward Livestream E-Commerce on Consumers' Purchase Intention

Li-Ru Chen [1,*], **Farn-Shing Chen** [2] **and Der-Fa Chen** [1,*]

1   Department of Industrial Education and Technology, National Changhua University of Education, Changhua 50074, Taiwan
2   Department of Automation Engineering and Institute of Mechatronoptic Systems, Chienkuo Technology University, Changhua 500020, Taiwan
*   Correspondence: chen_907@yahoo.com.tw (L.-R.C.); dfchen@cc.ncue.edu.tw (D.-F.C.)

Abstract: The booming development of livestream e-commerce has attracted considerable academic attention, but research on how social presence affects consumers' purchase decisions is limited. To this end, this article proposed a theoretical framework for the influence of social presence on consumers' purchasing decisions based on social presence theory. In this study, structural equation modeling was carried out on 390 data collected from a questionnaire to verify the mechanisms by which social presence influences purchase intention. The study found that social presence enhances consumer identification, which in turn enhances consumers' purchase intention. Meanwhile, this study not only verified the mediating role of consumer identification but also tested the positive moderating role of self-improvement by livestream e-commerce. This study found that a live streaming host's social presence influences the consumers' purchase behavior, and it provides decision support for companies to sell products through livestreaming platforms, which has important theoretical significance and practical application value.

Keywords: live streaming host; consumer identification; social presence; purchase intention; self-improvement

1. Introduction

Livestream e-commerce is growing rapidly, fueled by 5G. Particularly during the epidemic, offline stores faced a plunge in traffic and stagnant sales, and the market turned more attention to online live streaming [1]. Live streaming is favored by consumers because of its excellent social presence and its ability to simulate the experience of real scenarios, which opens a fast track for the "online + offline" marketing mix and accelerates the commercialization of livestream e-commerce [2]. In fact, as an emerging industry, livestream e-commerce operates in the form of "online + offline". Specifically, e-commerce anchors bring goods through their own charms to gain attention and resources; e-commerce platforms provide live streaming platforms to attract traffic; and brands provide products for online marketing [3]. More importantly, livestream e-commerce is accepted and sought after by the market, which on the surface is a shift in economic orientation but behind the scenes is mainly stimulated by consumers' social presence [4].

Social presence is defined as the extent to which a person in a media environment is perceived as a 'person in a real environment' and the sense of connection with others in the communication process of using media [5], reflecting the extent to which a communication channel facilitates the recognition of communication partners and relationships [6]. Social presence enhances users' perceived safety and purchase attitudes when shopping online [7,8]. Other studies have also found that, for example, users interacting with merchants online can enhance the sense of presence and increase the perception of store identity, while the use of avatars can enhance hedonic value through presence and enhance consumers' behavioral propensity to make purchases [9].

In the livestream e-commerce context, consumers enjoy the fun of participation by watching the live streaming host, watching the discussion and grabbing the deals [4,10], which stimulates social presence and immerses consumers. Social presence stimulates consumers to interact with anchors in real time and to be engaged by the atmosphere of other buyers, thus making the buying experiences more like shopping offline [11]. As you can see, the instant interactivity of live streaming makes buying online easier, more direct, more convenient and brings a more realistic social presence. However, the social presence in the live environment is only a background—not a feeling of immersion that leads to avid participation in the shopping behavior [12] but the consumer identity that lies beneath the surface of immersion.

From the surface phenomenon, consumers feel that the livestream shopping atmosphere is more exciting, more tangible and more intense; from the perspective of consumer psychology and behavior, the real-time interaction and rising atmosphere in a livestream e-commerce scenario develops consumer identity to make users "addicted" to continuous participation [13]. An enthusiastic atmosphere leads to consumer identification, and excitement further strengthens consumer identification [14], which in turn influences their purchase behavior through consumer identification. However, the current study lacks support from empirical tests on social presence influencing their purchase intention through consumer identification. Accordingly, this paper will address how social presence drives consumers' purchase intentions by means of the intermediate mechanism known as consumer identification. More precisely, this paper will be looking into the role of social presence on purchase intention both directly and indirectly through consumer identification.

In the livestream e-commerce scenario, self-improvement reflects the positive recognition and evaluation of live streaming hosts by consumers, illustrating the importance of live streaming hosts in helping consumers (e.g., increasing consumer self-esteem) [15–17]. This self-improvement of live streaming hosts leads to an increase in sales, ratings, and traffic of livestream e-commerce, and live streaming hosts are positively labeled by their fan base [4,15]. In the livestream e-commerce scenario, live streaming hosts have a huge fan base and video broadcasting, and they implant advertisements directly or euphemistically in the livestream through self-improvement marketing techniques, talking with and watching their fans while marketing; thus, social presence with livestream e-commerce affects consumer identification through the moderating role of self-improvement. The higher the degree of self-improvement of live streaming hosts, the higher the sales, quality and popularity of live streaming rooms [16]. Consumers may therefore consider whether to purchase goods [1,17]. Fans receive hints of consumption signals in a subtle way and thus interact with each other to influence consumption psychology and behavior [4]; thus, social presence with livestream e-commerce affects individuals' purchase intention through the moderating role of self-improvement. Therefore, according to the available research findings [18], this paper will further investigate the moderating role of individual differences in consumers' cultural values on the relationship between social presence and behavioral outcomes in the context of Chinese livestream e-commerce in China. That is, the relationship between consumer identity and purchase intention is further examined through consumer self-improvement with local Chinese cultural characteristics, and the mediating role of consumer identity in the relationship between social presence and purchase behavior is examined (see Figure 1).
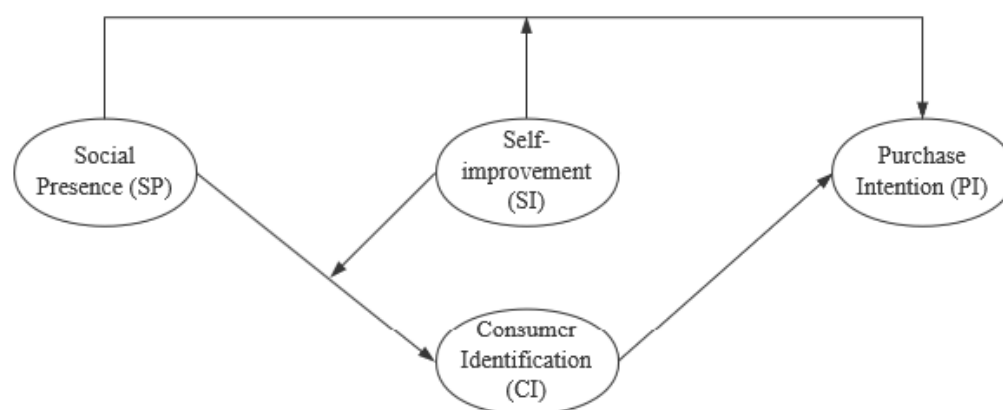
Figure 1. Theoretical model.

2. Theoretical Review

2.1. Social Presence Theory

Social presence originally referred to the extent to which "another person is perceived as present" (including the perception of others through technology) as a psychological being [5,19]. The study considered social presence as the result of social situations in which individuals communicate with other individuals in contexts that range from human images (e.g., profile pictures) to interpersonal texts to references to other users [20], which can help individuals shorten the social distance between communication parties and enhance the user's perception of others in virtual activities. Thus, reference [21] noted that when users perceive the presence of others in a virtual environment, they are more likely to generate interpersonal interactions, perceived support and trust. Furthermore, [22] pointed out that social presence is beneficial in motivating individuals' offline positive behaviors, thus preventing disengagement from offline positive behaviors.

Scholars have conducted a series of studies on consumer attitudes and behaviors around the social presence in marketing [23–25]. Previous research has discussed the impact of social presence that affects online service improvement, virtual shopping center design and online shopping decisions, online community building, human–computer interaction [26], purchase intention [27], perceived security [28], and online transaction trust [29], among other influences, and promotes positive consumer attitudes [25]. In summary, this study defines social presence as the extent of individuals' perceived 'real human beings' during their interactions with live streaming hosts and other users in the live streaming room.

Social presence is richly applied and intensively researched in the marketing field. Unfortunately, however, previous research has not tackled the highly real-time, direct and convenient interactivity in live marketing and its impact on consumer purchases [17,21]. Social presence created by the livestream e-commerce scene has a strong potential to have an indirect effect on consumer herding and behavior through identity and normative influences. Although a number of past findings have revealed some of the effects of social presence as regards consumer website trust, consumer attitudes and their purchasing behavior, the application and expansion of social presence in livestream e-commerce are limited. However, the application and expansion of social presence in the livestream e-commerce field is still limited, and the mechanisms of social presence by livestream e-commerce context have yet to be investigated. Most importantly, in the context of the rise of live e-commerce marketing, consumers have instant access to a wealth of information about shopping and the desire to consume. However, existing research on social presence does not concern real-time, direct and facilitated interactions with other consumers, and no studies have yet explored the impact and mechanisms of social presence on online consumer behavior in live marketing.

2.2. Hypotheses Development

2.2.1. Social Presence toward Livestream E-Commerce and Individuals' Purchase Intention

Social presence means the perceived extent to which the presence of others is felt during communication exchanges and reflects the fact that individuals develop an intimacy or direct feeling toward the communication medium during interpersonal interactions [5]. Social presence has a significant role to play in consumer psychology and behavior in the online shopping arena, notably in the absence of face-to-face communication and interaction with consumers and retailers. Refs. [30–32] found that social business technology factors can positively influence an individual's social presence, such as virtual agents, rich social information, 3D displays, human–computer-like interaction and telepresence. These studies provided a good explanation of the role of communication media in transmitting social signals, showing that computers as mediated communication (e.g., chat boxes or online customer centers) can stimulate individuals to generate social presence.

Research showed that to maintain a high level of immersion in online shopping, two things should be in place: first, a computer as the primary information transfer tool and an appropriate software system as the interface through which users can access information. Second, users have two or more channels of interaction with each other to transmit information to each other and generate substantive interactions [33]. The subject of this study is livestream e-commerce, which has the characteristic of high social presence. Specifically, a live streaming host performs through a live streaming platform, which enables buyers and sellers to interact and transact in real time with a computer as the communication tool, which not only satisfies the main medium of information dissemination by computer but also satisfies the interactive behavior in the process of information transmission. For social presence in a livestream e-commerce scenario, online shopping usually takes the direct platform as the intermediary of communication, which can not only convey tactile, eye care and other non-verbal interpersonal cues but also easily make consumers feel a higher sense of presence and thus drive consumers' purchase intention. Evidently, the stronger the consumer's social presence, the stronger the purchase intention. Thus, we hypothesize:

H1: *Social presence toward livestream e-commerce positively affects individuals' purchase intention.*

2.2.2. Social Presence toward Livestream E-Commerce and Consumer Identification

According to Bhattacharya and Sen (2003), consumer identification refers to the loyalty relationship formed between consumers and livestream e-commerce, which expresses the consumers' approval attitude toward livestream e-commerce [34]. In the livestream e-commerce scenario, consumers can interact with other consumers by liking, commenting, or sharing, or interact with live streaming hosts through direct messaging, thus creating a sense of identity, forming loyalty to livestream e-commerce and reducing the distance between merchants and consumers [35]. In fact, the relationship between social presence and consumer identification has been confirmed by Saffer et al. (2013) [36]. In particular, consumers are more willing to increase their willingness to provide information when they perceive a direct interaction between the individual and the live streaming host, which leads to a positive consumer identification [36]. In the livestream e-commerce scenario, the interaction between consumers and live streaming hosts can stimulate a strong social presence of consumers. Under the effect of social presence, consumers' inner selves are awakened and their needs are satisfied from the perspectives of compensation psychology, crowd mentality and self-actualization. Obviously, the strong social presence in the livestream e-commerce scene can have a positive effect on consumers' identity in terms of cognition and emotion. We thus hypothesize:

H2: *Social presence toward livestream e-commerce positively affects consumer identification.*

2.2.3. Consumer Identification toward Livestream E-Commerce and Individuals' Purchase Intention

In the livestream e-commerce context, the message conveyed by the live streaming host leads to consumer identification, which in turn evokes consumer purchase intention for the products recommended by the live streaming host. This is because the increase in consumer identification enhances customer loyalty, increases customer tolerance of live streaming host errors and motivates customers to make suggestions to the live streaming host, which in turn enhances consumer purchase intention [37]. More importantly, the process of self-categorization of individuals not only provides a cognitive basis for the formation of consumer identification, but there are also opportunities for individuals to invest emotions in relationships (e.g., purchase intention and willingness to recommend [38,39]. In fact, consumer identification influences consumers' perception of the relationship between the firm and the product and ultimately affects their future purchase intention and recommendation intentions [38,39]. For example, it has been shown that consumers' identification with a foreign culture enhances consumers' evaluation of products from that country, which in turn increases consumers' purchase intention [40]. Obviously, there is a positive relationship between consumer identification and consumption behavior, and the stronger the consumer identification, the stronger the purchase intention. For this reason, in the livestream e-commerce context, consumer identification can enhance the psychological connection between consumers and live streaming hosts, which in turn affects their purchase intention. As a result, we expect that consumer identification will motivate consumers to generate a higher level of purchase intention.

H3: *Consumer identification toward livestream e-commerce improves as individuals' purchase intention.*

2.2.4. Mediating Role of Consumer Identification with Livestream E-Commerce

Identification is a response that acquires the consumer's internal perception and thus makes the essence or characteristics of the identified event part of the personal psychological structure; that is, consumers see the identified event as happening to them [41]. The cognitive assimilation effect pointed out that consumers prefer to respond positively to external information that is in agreement with their identity for the purpose of self-improvement [42]. When the mental representation of individuals' identities is dominant, they are inclined to view information that is aligned with their identities as correlated with and helpful for self-improvement, thus showing convergent behavioral intentions [43].

Consumer identity concentrates on "how people identify with the organizations or groups to which they belong" and "what impact identity has on people's attitude formation" [44]. For example, corporate reputation, trust, awareness, and social responsibility can influence consumer identification with a company. Based on their identification with a company, consumers will enhance their liking for the company's product brand and even generate customer loyalty [45,46]. In the livestream e-commerce context, consumers identify with the unique qualities that the live streaming host possesses, and this identification in turn influences subsequent consumer behavior and translates into the outward expression of personal value structure patterns. It can be seen that consumer identification reflects the identification of consumers with the personal characteristics of the live streaming host and their attitudes, if the higher the consumers' social presence, the stronger their identification, and the stronger their identification to purchase intention.

H4: *Consumer identification mediates the relationship between social presence toward livestream e-commerce and individuals' purchase intention.*

2.2.5. Moderating Role of Self-Improvement with Livestream E-Commerce

Self-improvement means the expression of positive recognition and an assessment of the individual in the course of interaction with others, thus enhancing the self [47,48].

Individual self-improvement is the primary motivation for self-evaluation, contributing to the need to increase self-esteem, seek a sense of self-worth, and improve self-image [49]. An individual defines the self in a particular social group, and the values of that social group directly influence the definition of the self-concept [50]. Research confirmed that individuals tend to become interested in the intentions of other groups and the ability to achieve such intentions during social interactions [51]. Social comparison theory [52] stated that people's internal evaluation of the self is grounded in a comparison of the perceived self or in-group with others or out-groups. Thus, if the self or in-group gains a comparative advantage in comparison with the out-group, the individual will develop a liking or attachment to the group to which he or she belongs because the positive values of the in-group will confer positive evaluations on the individual [53].

Similarly, when an individual's self-improvement is satisfied, the individual will make more positive evaluations of the group to which he or she belongs and even exaggerate the advantages of the social group to which he or she belongs in order to widen the distance between the in-group and the out-group. In the livestream e-commerce, the high competence, high altruistic motivation, and high morality expressed by the live streaming host with higher self-improvement will enhance consumers' self-identification and influence their purchase intention. Therefore, self-improvement positively affects the influence of consumers' social presence on consumer identification and individuals' purchase intention toward livestream e-commerce. The higher the live streaming host's self-improvement, the stronger the consumer's social presence and the stronger the consumer's identification with the live streaming host, and the lower it is, the stronger the opposite. The higher the live streaming host's self-improvement, the higher the consumers' social presence and the stronger the purchase intention of the live streaming host, and vice versa. Therefore, this paper examines the following hypothesis:

H5a: *Social presence with livestream e-commerce affects consumer identification through the moderating role of self-improvement.*

H5b: *Social presence with livestream e-commerce affects individuals' purchase intention through the moderating role of self-improvement.*

3. Sample and Measures

3.1. Sample Description

This questionnaire investigates the effect of social presence toward livestream e-commerce on consumers' purchase intention, so the main target of the research is the customers of livestream e-commerce. Participants for this study were recruited for the questionnaire through posting in the professional survey platform. This questionnaire will state the following in advance: "This is an academic research questionnaire to explore users' usage of TikTok. The content of the questionnaire is for academic research purposes only and will never be made public, thus participants are assured." Only consumers who are at least 18 years old and have used the Jitterbug e-commerce platform no less than six times to make purchases are eligible for the questionnaire. After verification of identity, a questionnaire chain was issued to participants with questionnaire eligibility, and data were collected through participants filling out the form online.

The study began collecting questionnaires in March 2022 and took five months to complete this work in August. Finally, we collected a total of 475 questionnaires, and 390 valid questionnaires were left after excluding invalid questionnaires. Of the 390 participants, 265 (32.1%) were female, 329 (84.4%) were unmarried, 46 (11.8%) were under 19 years of age (inclusive), 284 (72.8%) were 20–29 years of age, 18 (4.6%) were 30–39 years of age, 22 (5.6%) were 40–49 years of age, and the remaining participants were 50 years of age or older. In addition, 275 respondents had a bachelor's degree, occupying 70.5% of the total sample, while only 41 respondents (10.5%) had a graduate degree (see Table 1). The descriptive statistical analysis showed that the overall distribution of the sample was reasonable.

Table 1. Descriptive statistical analysis.

Variables	Item	Frequency	%
Gender	Male	125	32.1
	Female	265	67.9
Age	19 or less	46	11.8
	20~29	284	72.8
	30~39	18	4.6
	40~49	22	5.6
	50 or above	20	5.2
Marriage	Married	58	14.8
	Unmarried	329	84.4
	Divorce	3	0.8
Education	College and blow	74	19.0
	Undergraduate	275	70.5
	Master's degree and above	41	10.5
Consumption (RMB)	Below 2000	157	40.2
	2000~3999	102	26.2
	4000~5999	57	14.6
	6000 or more	74	19.0

3.2. Development of Measurement Instrument

The variables in this study were derived from those commonly used in previous empirical studies. We processed the questionnaire according to the back-translation procedure advocated by Brislin et al. [54], which has been shown to be a reliable and valid method in previous studies. The back-translation method ensured that all measured items were applicable to the livestream e-commerce scenario.

Social presence. As in the study by Ogara et al. [55], participants rated a five-item scale developed by [56] to assess their social presence. Sample items include "there is a sense of human contact toward Tik Tok livestream", "there is a sense of human warmth toward Tik Tok live", and "there is a sense of personness toward Tik Tok live" (1 = Strongly disagree, 7 = Strongly agree). Cronbach's alpha coefficient was 0.859.

Purchase intention. Participants measured their purchase intentions by using a 4-item scale adapted from [31,57]. Sample items include "given the chance, I intend to purchase from livestream e-commerce", and "given the chance, I predict that I should purchase from livestream e-commerce in the future" (1 = Strongly disagree, 7 = Strongly agree). Cronbach's alpha coefficient was 0.867.

Consumer identification. Consumer used a four-item scale from [37,58], which is specifically designed to measure the identity of consumers in livestream e-commerce scenarios. Sample items include "I empathize with the content of the live streaming host I am watching", and "I think the live streaming host's live content evokes an emotional response in you" (1 = Strongly disagree, 7 = Strongly agree). Cronbach's alpha coefficient was 0.876.

Self-improvement. Self-improvement was measured by using a scale developed by Nov et al. [59]. Participants measured their self-improvement through a 3-item scale with 3 items. Sample items include "when I help others, I feel needed," "when I help others, I feel like I become more important," and "when I help others, I feel elevated on a spiritual level" (1 = Strongly disagree, 7 = Strongly agree). Cronbach's alpha coefficient was 0.854.

Control variables. Referring to a previous study [59–62], we used participants' gender, age, marital status, and education as control variables.

4. Data Analyses and Results

4.1. Data Analysis

PLS is an innovative and integrated approach across different academic fields and is of high value in academic applications. With this in mind, this study focuses on the analysis of data using PLS. The specific analysis process is as follows. Firstly, SPSS 24.0 was used in this

paper to confirm the Cronbach's alpha coefficient of several variables (i.e., social presence, consumer identification, purchase intention and self-improvement) involved in the study. Secondly, this study used PLS software to conduct structural equation modeling to examine the outer model analysis in detail, including convergent and discriminant validity. Thirdly, this study uses PLS software to analyze the GOF to test the theoretical model constructed in this study for goodness of fit. On the basis of this, the path coefficients were analyzed to test the significance of the underlying hypothesis (Hypotheses 1–3). Fourthly, this study used PLS software to conduct a mediating effect analysis to test the moderating role of consumer identification between social presence and purchase intention (Hypothesis 4). Fifth, this study used PLS software to examine the mediating effect of individual self-improvement in moderating the relationship between social presence and the outcome variables (i.e., consumer identification and purchase intention) (Hypotheseses 5a and 5b).

4.2. Outer Model

We first test for convergent validity. According to Fang et al. [60], each variable was rigorously examined for Factor Loadings, rho_A, CR, and AVE. The factor loadings for social presence were 0.808, 0.844, 0.778, 0.790, and 0.773, respectively, so all five items were retained. The rho_A was 0.864, the CR was 0.898, and the AVE was 0.639; therefore, the reliability of social presence was verified. The factor loadings for the four items of consumer identification were 0.795, 0.883, 0.902, and 0.835, respectively; hence, all four items were retained. The reliability of consumer identification was verified as rho_A was 0.869, CR was 0.909 and AVE was 0.715. The factor loadings for the four items of purchase intention were 0.869, 0.857, 0.855, and 0.799, respectively, resulting in the retention of all four items. The reliability of purchase intention was verified as rho A was 0.869, CR was 0.909, and AVE was 0.715. The factor loadings for self-improvement were 0.853, 0.856, and 0.930, respectively; all four items were therefore retained. In addition, rho_A was 0.871, CR was 0.911, and AVE was 0.774; therefore, the reliability of self-improvement was validated. All four variables for convergent validity were met. Table 2 shows the results of average variance extracted used to test discriminant validity. This average variance extracted is a better analysis for structural equation modeling because it assesses that the square root of AVE (i.e., bold and italic in Table 2) for each variable is greater than the correlation between the variables [63–65]. Each of the bold and italic values retained in our results is exactly greater than the other values, providing excellent evidence of the discriminant validity.

Table 2. Discriminant validity.

| Variables	Mean	SD	1	2	3	4
1. Social presence	4.281	1.202	**0.799**			
2. Consumer identification	3.702	1.182	0.422	**0.855**		
3. Purchase intention	3.352	1.818	0.606	0.572	**0.845**	
4. Self-improvement	3.543	1.276	−0.485	−0.434	−0.450	**0.880**

Note. The bold diagonal value is the square root of AVE.

4.3. Inner Model

We first examined the relationships between the social presence and purchase intention; as expected, the relationship of H1 (T = 7.365, β = 0.444, $p < 0.01$) was found to be significant. Then, the results also indicated that social presence was significantly related to consumer identification (T = 6.340, β = 0.422, $p < 0.01$). Moreover, there was a positive significant association between consumer identification and purchase intention (T = 5.375, β = 0.385, $p < 0.01$). Thus, Hypotheses 1, Hypotheses 2, and Hypotheses 3 were supported (as shown in Table 3 and Figure 2).

Table 3. Path estimates.

Hypotheses and Paths	Path Coefficient (β)	p	T	f²	SD	Decision
H1: social presence → purchase intention	0.444 ***	***	7.365	0.317	0.060	Supported
H2: social presence → consumer identification	0.422 ***	***	6.340	0.216	0.066	Supported
H3: consumer identification → purchase intention	0.385 ***	***	5.375	0.239	0.072	supported

Note. *** $p < 0.001$.
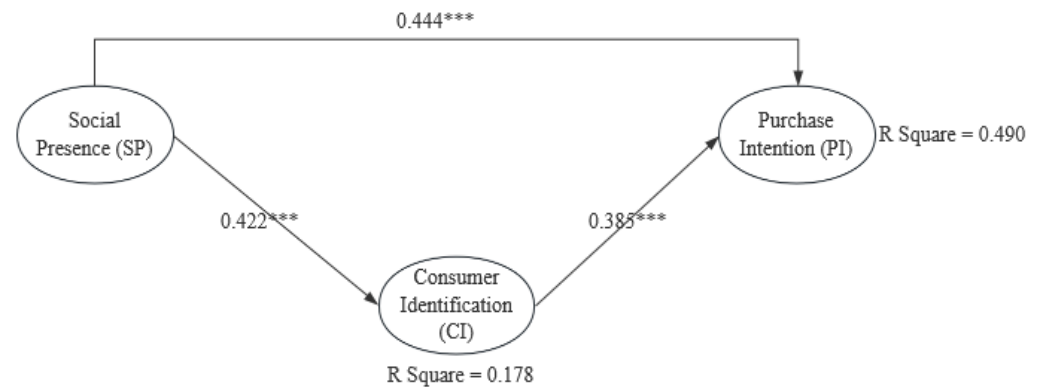
Figure 2. Path estimates. Note. *** $p < 0.001$.

To investigate the mediation structure of our hypothesized theoretical model (best expressed as a partially mediated path), we also examined a series of mediation models and assessed their indirect effects, standard errors, and confidence intervals. Specifically, we evaluated a total effect to test for the presence of an indirect effect, an indirect effect to test for the presence of a mediating effect, and a direct effect to verify whether the mediating effect was partially or fully mediated.

First, we estimated the size and significance of the total effect of social presence via consumer identification on purchase intention, and the total effect was significant (bias-corrected 95% CI = 0.286 to 0.561, $p < 0.05$ and bias-corrected 95% CI = 0.082 to 0.278, $p < 0.05$) as well as the between-effects effect. Finally, for the direct effect, bias-corrected 95% CI = 0.300 to 0.567, $p < 0.05$, indicating that it was significant and positive. Hypotheses 4 was thus partially mediated. The indirect effects are summarized in Table 4.

Table 4. Mediation effect.

Model	Estimate	p	Lower	Upper
Total effect	0.425	***	0.286	0.561
Indirect effect	0.163	**	0.082	0.278
Direct effect	0.444	***	0.300	0.567

Note. ** $p < 0.01$, *** $p < 0.001$.

This study also examined the slopes of all levels of conditioning to check under what conditions the slope of social presence on consumer identification was positive or significant. For individuals with high self-improvement, the slope remained persistently significant (β = 0.242, $p < 0.01$). For low self-improvement, the slope remained positive and significant for all individuals (β = 089, $p < 0.01$). In short, Hypotheses 5a was supported; see Figure 3 for a graphical representation of the analysis of moderating effect. Given that the moderation coefficients were estimated simultaneously, we also examined under what conditions the slope of social presence on purchase intention was positive or significant. For individuals with high levels of self-improvement, the slope remained persistently significant (β = 0.582, $p < 0.01$) (β = 0.918, $p < 0.01$ for individuals holding low self-improvement). In short, Hypotheses 5b was supported; see Figure 4 for a graphical analysis of the moderating effect.
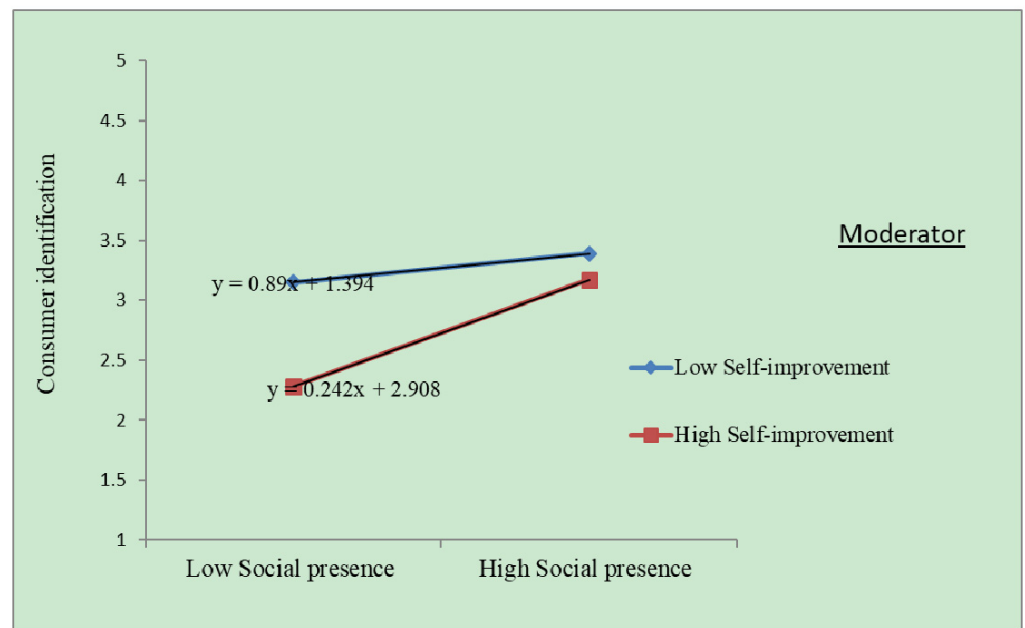
Figure 3. Moderating effects of self-improvement.
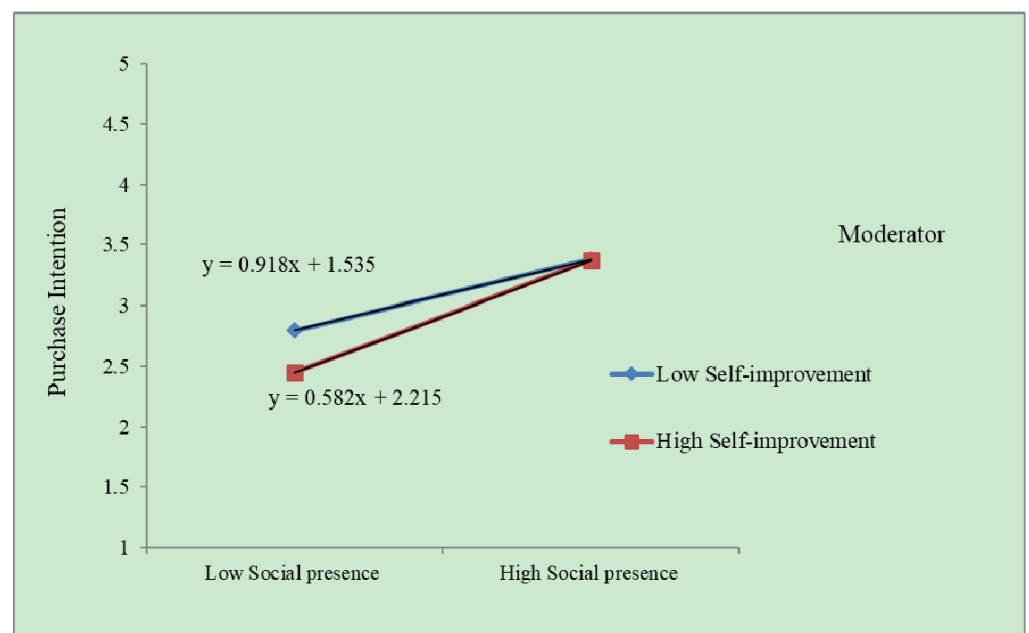
Figure 4. Moderating effects of self-improvement.

5. Discussion

First, the direct role of social presence on purchase intention was verified. What this means is that social presence toward livestream e-commerce increase alongside individuals' purchase intention, which validates the results of previous studies. Under the social influence marketing model, the content presented by netizens is mostly idealized by the audience in real life, and through virtual interaction, the audience can experience a strong social presence. Facilitated by direct, real-time and efficient interaction, it allows consumers to temporarily disconnect from reality, from soothing the stresses they face in real life, and simply seek the satisfaction that comes from social presence, which leads to their purchase intentions. This shows that watching a live streaming host can stimulate consumers' social presence from the consumer's psychological level, so that consumers do not live but have the feeling of face-to-face with the live streaming host, and this stimulates and

increase consumers' purchase intention of products by awakening users to the warmth and shopping scene similar to the real environment.

Second, the role of social presence on purchase intention through consumer identification was verified. The results of data analysis indicated that consumer identification mediated the role between social presence by livestream e-commerce and individuals' purchase intention. It was verified through structural equation modeling that live streaming hosts attract consumers through social presence to avoid the stresses of real life and briefly immerse them in an illusory world to reach a certain idealized state of life. The study also identifies with the products recommended by the live streaming host, so that consumers have a deep emotional connection with them and increase the purchase intention of the products by evoking identification with the live streaming host and their recommended products. This is due to the fact that when enhancing the social presence of consumers, it enhances the audience's recognition of the live streaming host, and the audience will feel that the netizens are more professional and attractive in their knowledge of the products, thus enhancing the purchase intention.

Finally, the moderating role of self-improvement was verified. What this means is that consumer self-improvement plays a moderating role between social presence and consumer identification. Moderating role of self-improvement between social presence and consumer identification implies that when self-improvement is higher, audiences' perceptions are more fluid and they are more willing to immerse themselves in the virtual world, which in turn increases their identification with the live streaming host.

In addition, the results indicated that consumer self-improvement has a moderating direct role of social presence toward livestream e-commerce which increases alongside individuals' purchase intention, and the findings were consistent with previous studies of logical reasoning. The moderating effect of self-improvement on the impact of social presence on purchase intention may be due to the fact that as consumer self-improvement increases, consumer social presence continues to increase, which leads to an increasing effect of social presence by livestream e-commerce on individuals' purchase intention, which is also increasing.

6. Conclusions

6.1. Implications for Academic Contributions

First, the study constructs a new perspective regarding the impact of social presence on purchase intention. Existing studies do not have theoretical explanations for the psychological impact and inner formation mechanism of consumers watching a live streaming host, and past studies have mainly been qualitative in their approach. However, live hosting, a direct interactivity and multi-faceted real-time communication with consumers, as a marketing model, overturns the stereotype of one-way information dissemination in traditional research. This research has taken the ordinary consumer as its respondent, constructs the intermediate process and results of social presence influencing their purchase intention, and develops a rich discussion on consumer attention and product purchase intention. To this end, this study's structural equation modeling discussion, through data analysis, verified the psychological mechanism of the live streaming host's fan base for the live streaming host's recommended product purchase intention, effectively compensating and expanding the reliability of the study findings.

Second, the moderating role of self-improvement was examined. This study introduced self-improvement to examine self-improvement as a moderating variable in the relationship between social presence affecting consumer identification and individual purchase intention with livestream e-commerce. The boundary conditions of the effect of presence on consumer identification and purchase intention are revealed, providing important insights for the further development of purchase intention with livestream e-commerce. This article proposes a new explanatory perspective for the empirical study of self-improvement and has positive academic value for enriching the application of the moderating effect of self-improvement.

6.2. Implications for Practical Implications

First, the persona and positioning of live streaming hosts should be shaped. This paper verifies the moderating role of live streaming host self-improvement between social presence and consumer identification, i.e., when the level of live streaming host self-improvement is high, consumers generate social presence. When the level of self-improvement of the live streaming host is high, consumers will have a higher identification with the live streaming host and thus increase the purchase intention. Meanwhile, social presence with livestream e-commerce affects individuals' purchase intention through the moderating role of self-improvement, which is also explored in detail. Therefore, the live streaming host group should shape its own characteristic persona and positioning, develop and explore its own strengths, consciously abandon the vulgar content that catches the eye for a while, use creative thinking to shape a positive picture and imagination for the audience, and guide the positive live content.

Second, the live streaming host-marketing effect ought to be utilized. Live streaming host marketing is of great importance; compared to traditional spokesperson advertising, social presence can greatly close the psychological distance with the audience. In addition, psychological arousal can inspire consumers to purchase the live streaming host's promotion products. In addition, live streaming e-commerce operators can take advantage of the live host's celebrity status to sell in advance and then produce according to consumer orders, which can increase revenue while reducing costs. In the advance sales procedure, information gathering via communication with fans, personalization and precision marketing can also be used to gain an edge over the competition.

Third, live streaming host behavior should guide positive consumer values. For example, the government can introduce strict safety regulations for network governance and promote self-monitoring and the strict management of live streaming platform supervisors. Live streaming platform supervisors should also take responsibility for introducing comprehensive "live streaming room violation management regulations" and "live streaming host self-discipline convention" and so on, including the live streaming host's dress, behavior, and outdoor live detailed regulation in order to purify the live streaming host live environment. Simultaneously, the live streaming platform should assume corporate social responsibility, carry the mainstream core values, spread positive energy, and according to the characteristics of different types of live streaming host, have vision and strategy to invest in live streaming hosts with potential to achieve the benign and sustainable development of live streaming host marketing.

7. Limitations

This study used the Tik Tok live streaming platform as the research object and analyzed the collected data through structural equation modeling, which makes the findings (including theoretical contributions and practical implications) empirically supported. However, as the subject of this study was limited to mainland China, this may make the findings ineffective in representing the effect of social presence toward foreign livestream e-commerce on consumers' purchase intention

For this reason, the conclusions drawn in this study cannot be separated from the testing and development of foreign live e-commerce platforms, thus helping to enhance the relevance of their theoretical contributions in academic research, and contribute to its implications for business practice. In a follow-up study, data collection on live e-commerce platforms in developed countries could be considered to validate the mechanisms at play for the social presence of different types of live e-commerce consumers in the same industry. For example, data can be collected from foreign livestream e-commerce such as Amazon Live, Instagram, YouTube, etc. to validate and analyze using samples from developed countries.

Furthermore, a group comparison of different samples' live e-commerce platforms can be considered to explore the variability of social presence on consumer purchase behavior

under different market segments, to provide marketing strategies for different segments of live e-commerce and to enhance the generalizability of the study's findings.

Additionally, this study only explored the moderating role of self-improvement in the mechanism of the role of individual social presence. Self-enhancement plays an important value in the relationship between social presence by live streaming platforms and consumer identification as well as between social presence and individual purchase intention. However, the moderating variables that influence their relationship are not limited to this study; thus, future research could try to enrich existing studies by adding other variables.

Author Contributions: Conceptualization, L.-R.C., F.-S.C. and D.-F.C.; methodology, L.-R.C. and D.-F.C.; validation, F.-S.C.; formal analysis, L.-R.C. and D.-F.C.; investigation, L.-R.C. and D.-F.C.; writing—original draft preparation, L.-R.C., F.-S.C. and D.-F.C.; writing—review and editing, L.-R.C., F.-S.C. and D.-F.C.; visualization, L.-R.C.; supervision, D.-F.C. All authors have read and agreed to the published version of the manuscript.

References

1. Jong, D.; Tseng, Y.; Wang, T. Accessing the Influence of User Relationship Bonds on Continuance Intention in Livestream E-Commerce. *Sustainability* **2022**, *14*, 5979. [CrossRef]
2. Cheng, H.; Huang, Y.-T.; Huang, J. The Application of DEMATEL-ANP in Livestream E-Commerce Based on the Research of Consumers' Shopping Motivation. *Sci. Program.* **2022**, *2022*, 4487621. [CrossRef]
3. Liu, I.-F.; Hung, H.-C. How are Live-Streaming Services and Social Media Platforms Changing On-Job MBA Students' Learning? A Case Study for Applying e-Case Live in Management Case-Based Learning in Taiwan. *IEEE Access* **2020**, *8*, 120936–120945. [CrossRef]
4. Liu, X.; Wang, D.; Gu, M.; Yang, J. Research on the influence mechanism of anchors' professionalism on consumers' impulse buying intention in the livestream shopping scenario. *Enterp. Inf. Syst.* **2022**. [CrossRef]
5. Parker, E.B.; Short, J.; Williams, E.; Christie, B. *The Social Psychology of Telecommunications*; John Willey and Sons: London, UK, 1976.
6. Fulk, J.; Steinfield, C.W.; Schmitz, J.; Power, G.J. A social information processing model of media use in organizations. *Commun. Res.* **1987**, *14*, 529–552. [CrossRef]
7. Gunawardena, C.N.; Little, F.J. Social Presence as a Predictor of Satisfaction within a Computer-mediated Conferencing Environment. *Am. J. Distance Educ.* **1997**, *11*, 8–26. [CrossRef]
8. Shen, J. Social Comparison, Social Presence, and Enjoyment in the Acceptance of Social Shopping Websites. *J. Electron. Commer. Res.* **2012**, *13*, 198–212.
9. Gefen, D.; Straub, D.W. Consumer Trust in B2C E-commerce and the Importance of Social Presence: Experiments in E-products and E-services. *Omega* **2004**, *32*, 407–424. [CrossRef]
10. Sun, K.; Liu, L.C.; Liu, C.L. Impulsive Purchase Intentions of Live E-Commerce Consumers from an Emotional Perspective. *China Bus. Mark.* **2022**, *36*, 33–42.
11. Fan, X.J.; Jiiang, X.Y.; Ni, R.R.; Dong, X.B. Influence of Interactivity of Mobile Live-Video Broadcast on Intention of Continuous Use of Users. *J. Syst. Manag.* **2020**, *29*, 294–307.
12. Chen, Y.; Xiong, F. The Business Model of Live Streaming Entertainment Services in China and Associated Challenges for Key Stakeholders. *IEEE Access* **2019**, *7*, 116321–116327. [CrossRef]
13. Su, X. An Empirical Study on the Influencing Factors of E-Commerce Live Streaming. In Proceedings of the 2019 International Conference on Economic Management and Model Engineering (ICEMME), Malacca, Malaysia, 6–8 December 2019; pp. 492–496.
14. Ye, C.Z.; Zheng, R.R.; Li, L.L. The effect of visual and interactive features of tourism live streaming on tour-ism consumers' willingness to participate. *Asia Pac. J. Tour. Res.* **2022**, *27*, 506–525. [CrossRef]
15. Wang, Q.Z.; Yang, Y.; Wang, Q.; Ma, Q.G. The effect of human image in B2C website design: An eye-tracking study. *Enterp. Inf. Syst.* **2014**, *8*, 582–605. [CrossRef]
16. Chou, C.Y.; Chen, J.S.; Lin, S.K. Value cocreation in livestreaming and its effect on consumer-simulated experience and continued use intention. *Int. J. Consum. Stud.* **2022**, *14*, 520–552. [CrossRef]
17. Pang, Q.; Meng, H.; Fang, M.; Xing, J.; Yao, J. Social Distancing, Health Concerns, and Digitally Empowered Consumption Behavior Under COVID-19: A Study on Livestream Shopping Technology. *Front. Public Health* **2021**, *9*, 748048. [CrossRef]

18. Fang, J.; Chen, L.; Wen, C.; Prybutok, V.R. Co-viewing Experience in Video Websites: The Effect of Social Presence on E-Loyalty. *Int. J. Electron. Commer.* **2018**, *22*, 446–476. [CrossRef]

19. Biocca, F.; Harms, C.; Burgoon, J.K. Toward a More Robust Theory and Measure of Social Presence: Review and Suggested Criteria. *Presence Virtual Augment. Real.* **2003**, *12*, 456–480. [CrossRef]

20. Kumar, J.A.; Abirami, S. Opinion-Based Co-Occurrence Network for Identifying the Most Influential Product Features. *J. Eng. Res.* **2020**, *8*, 185–205. [CrossRef]

21. Hassanein, K.; Head, M. Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. *Int. J. Hum.-Comput. Stud.* **2007**, *65*, 689–708. [CrossRef]

22. Bulu, S.T. Place presence, social presence, co-presence, and satisfaction in virtual worlds. *Comput. Educ.* **2012**, *58*, 154–161. [CrossRef]

23. Chen, J.; Kou, G. How Online Review Valance Affect on Consumer Opinion Evaluation? *Procedia Comput. Sci.* **2016**, *91*, 635–641. [CrossRef]

24. Lee, E.-J.; Shin, S.Y. When do consumers buy online product reviews? Effects of review quality, product type, and reviewer's photo. *Comput. Hum. Behav.* **2014**, *31*, 356–366. [CrossRef]

25. Rodriguez-Molina, M.A.; Frias-Jamilena, D.M.; Castaneda-Garcia, J.A. The contribution of website design to the generation of tourist destination image: The moderating effect of involvement. *Tour. Manag.* **2015**, *47*, 303–317. [CrossRef]

26. Lee, K.M.; Nass, C. Social-psychological origins of feelings of presence: Creating social presence with machine-generated voices. *Media Psychol.* **2005**, *7*, 31–45. [CrossRef]

27. Keng, C.-J.; Chang, W.-H.; Chen, C.-H.; Chang, Y.-Y.; Ching-Jui, K.; Wen-Hua, C.; Chin-Hua, C.; Ya-Yi, C. Mere Virtual Presence with Product Experience Affects Brand Attitude and Purchase Intention. *Soc. Behav. Pers. Int. J.* **2016**, *44*, 431–444. [CrossRef]

28. Shin, D.-H.; Shin, Y.-J. Consumers' Trust in Virtual Mall Shopping: The Role of Social Presence and Perceived Security. *Int. J. Hum.-Comput. Interact.* **2011**, *27*, 450–475. [CrossRef]

29. Lu, B.; Fan, W.; Zhou, M. Social presence, trust, and social commerce purchase intention: An empirical research. *Comput. Hum. Behav.* **2016**, *56*, 225–237. [CrossRef]

30. Wang, X.; Laffey, J.; Xing, W.; Ma, Y.; Stichter, J. Exploring embodied social presence of youth with Autism in 3D collaborative virtual learning environment: A case study. *Comput. Hum. Behav.* **2016**, *55*, 310–321. [CrossRef]

31. Pavlou, P.A.; Xue, L.Y. Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-agent Perspective. *MIS Q.* **2007**, *31*, 105–136. [CrossRef]

32. Qiu, L.; Benbasat, I. An Investigation into the Effects of Textto-Speech Voice and 3d Avatars on the Perception of Presence and Flow of Live Help in Electronic Commerce. *ACM Trans. Comput.-Hum. Interact.* **2005**, *12*, 329–355. [CrossRef]

33. Ha, L.; James, E.L. Interactivity reexamined: A baseline analysis of early business web sites. *J. Broadcast. Electron. Media* **1998**, *42*, 457–474. [CrossRef]

34. Bhattacharya, C.B.; Sen, S. Consumer-company identification: A framework for understanding consumers' relationships with companies. *J. Mark.* **2003**, *67*, 76–88. [CrossRef]

35. Garrison, D.; Cleveland-Innes, M.; Fung, T.S. Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *Internet High. Educ.* **2010**, *13*, 31–36. [CrossRef]

36. Saffer, A.J.; Sommerfeldt, E.J.; Taylor, M. The Effects of Organizational Twitter Interactivity on Organization: Public Relationships. *Public Relat. Rev.* **2013**, *39*, 213–215. [CrossRef]

37. Wu, W.Y.; Tsai, C.H. The Empirical Study of CRM: Consumer Company Identification and Purchase Intention in the Direct Selling Industry. *Int. J. Commer. Manag.* **2008**, *17*, 194–210. [CrossRef]

38. Deng, X.; Xu, Y. Consumers' Responses to Corporate Social Responsibility Initiatives: The Mediating Role of Consumer–Company Identification. *J Bus Ethics* **2017**, *142*, 515–526. [CrossRef]

39. Ji, Y.-J.; Lee, S.-H.; Kim, Y.-H. The Impact of Corporate Social Responsibility Activities on Organization Trust, Loyalty and Purchase Intention. *J. Ind. Converg.* **2019**, *17*, 59–67. [CrossRef]

40. Lee, J.K. The effects of team identification on consumer purchase intention in sports influencer marketing: The mediation effect of ad content value moderated by sports influencer credibility. *Cogent Bus. Manag.* **2021**, *8*, 1957073. [CrossRef]

41. Duarte, P.A.D.O.; Silva, S.C. The role of consumer-cause identification and attitude in the intention to purchase cause-related products. *Int. Mark. Rev.* **2018**, *37*, 603–620. [CrossRef]

42. Wheeler, S.C.; Petty, R.; Bizer, G.Y. Self-Schema Matching and Attitude Change: Situational and Dispositional Determinants of Message Elaboration. *J. Consum. Res.* **2005**, *31*, 787–797. [CrossRef]

43. Tu, K.A.; Zhang, Y. A Short 8-Item Scale for Measuring Consumers' Local-Global Identity. *Int. J. Res. Mark.* **2012**, *29*, 35–42. [CrossRef]

44. Porral, C.C.; Lang, M.F. Private labels: The role of manufacturer identification, brand loyalty and image on purchase intention. *Br. Food J.* **2014**, *17*, 506–522.

45. Rocha, C.M.; Fink, J.S. Patriotism, national athletes and intention to purchase international sports products. *Int. J. Sport. Mark. Spons.* **2015**, *16*, 57–71. [CrossRef]

46. Dang, V.T.; Nguyen, N.; Wang, J. Consumers' perceptions and responses towards online retailers' CSR. *Int. J. Retail. Distrib. Manag.* **2020**, *48*, 1277–1299. [CrossRef]

47. Hogg, M.A.; Terry, D.J.; White, K.M. A tale of two theories: A critical comparison of identity theory with social identity theory. *Soc. Psychol. Q.* **1995**, *58*, 255–269. [CrossRef]

48. Hui, C.M.; Bond, M.H. To please or to neglect your partner? attachment avoidance and relationship riven self improvement. *Pers. Relatsh.* **2009**, *16*, 129–145.

49. Overall, N.C.; Fletcher, G.J.O.; Simpson, J.A. Helping Each Other Grow: Romantic Partner Support, Self-Improvement, and Relationship Quality. *Pers. Soc. Psychol. Bull.* **2010**, *36*, 1496–1513. [CrossRef]

50. Serhieienkova, O.P. Peculiarities of personal self- improvement in early and late adolescence. *Social Welfare* **2019**, *2*, 8–19.

51. Fiske, S.T.; Cuddy, A.J.C.; Glick, P.S.; Xu, J. A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *J. Personal. Soc. Psychol.* **2002**, *82*, 878–902. [CrossRef]

52. Festinger, L. A Theory of Social Comparison Processes. *Hum. Relat.* **1954**, *7*, 117–140. [CrossRef]

53. Kim, S.-H.; Lee, R.; Ahn, H.-K. When Do Consumers Purchase Self-improvement Products?: The Interplay between the Type of Self-improvement and Envy. *J. Consum. Stud.* **2020**, *31*, 25–39. [CrossRef]

54. Brislin, R.W. The wording and translation of research instruments. In *Field Methods in Cross-Cultural Research*; Lonner, W.J., Berry, J.W., Eds.; Sage: Newcastle upon Tyne, UK, 1986; pp. 137–164.

55. Ogara, S.O.; Koh, C.E.; Prybutok, V.R. Investigating factors affecting social presence and user satisfaction with mobile instant messaging. *Comput. Hum. Behav.* **2014**, *36*, 453–459. [CrossRef]

56. Gao, W.; Liu, Z.P.; Li, J.Y. How does social presence influence SNS addiction? A belongingness theory perspective. *Comput. Hum. Behav.* **2017**, *77*, 347–355. [CrossRef]

57. Lin, C.P.; Chen, S.C.; Chiu, C.K.; Lee, W.Y. Understanding Purchase Intention During Product-Harm Crises: Moderating Effects of Perceived Corporate Ability and Corporate Social Responsibility. *J. Bus. Ethics* **2011**, *102*, 455–471. [CrossRef]

58. Kim, H.H.; Han, E.K. The application of the theory of planned behavior to identify determinants of donation intention: Towards the comparative examination of positive and negative reputations of nonprofit organizations CEO. *Sustainability* **2020**, *12*, 9134. [CrossRef]

59. Nov, O.; Naaman, M.; Ye, C. Analysis of Participation in an Online Photo Sharing Community: A Multidimensional Perspective. *J. Assoc. Inf. Sci. Technol.* **2010**, *61*, 555–566. [CrossRef]

60. Yang, M.; Suanpong, K.; Ruangkanjanases, A.; Yu, W.; Xu, H. Development and Validity Test of Social Attachment Multidimensional Scale. *Front. Psychol.* **2022**, *12*, 757777. [CrossRef]

61. Yang, M.S.; Hu, S.G.; Kpandika, B.E.; Liu, L. Effects of Social Attachment on Social Media Continuous Usage Intention: The mediating role of affective commitment. *Hum. Syst. Manag.* **2021**, *40*, 619–631. [CrossRef]

62. Wang, Q.Q.; Yang, M.; Zhang, W.S. Accessing the Influence of Perceived Value on Social Attachment: Developing Country Perspective. *Front. Psychol.* **2021**, *12*, 760774. [CrossRef]

63. Fang, G.G.; Qalati, S.A.; Ostic, D.; Shah, S.M.M.; Ali Mirani, M. Effects of entrepreneurial orientation, social media, and innovation capabilities on SME performance in emerging countries: A mediated–moderated model. *Technol. Anal. Strateg. Manag.* **2021**, *34*, 1326–1338. [CrossRef]

64. Fornell, C.R.; Lacker, D.F. Structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 382–388. [CrossRef]

65. Hair, J.F.; Risher, J.J.; Sarstedt, M.; Ringle, C.M. When to use and how to report the results of PLS-SEM. *Eur. Bus. Rev.* **2019**, *31*, 2–24. [CrossRef]