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Link Virtual Community Interaction and Citizenship Behavior of Fitness Club Customers: The Role of Psychological Empowerment and Sense of Community

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Abstract: Through social exchange theory, this study explores the relationship of virtual social interaction on customer citizenship behavior. By using a sample of 363 fitness enthusiasts from China, this study found that the three dimensions of virtual community interaction have a positive impact on customer citizenship behavior. Moreover, this study found that psychological empowerment partially mediated the relationship between the three dimensions of virtual community interaction and customer citizenship behavior. Secondly, this study also found that the effect of virtual community interaction on psychological empowerment was conditional on a sense of community. The results of this study suggested that managers should pay attention to the important role of user interaction in a virtual community and guide users to form high-quality interactions. Furthermore, managers should also pay attention to the importance of customer citizenship behavior to make users as employees participate in the interaction in a virtual community to enrich the integrity of the interaction. Lastly, managers need to pay attention to users' sense of belonging and identity regarding the virtual community and encourage users to obtain incentives through the combination of online and offline activities to create the most benefits for the virtual community of fitness clubs.

Keywords: virtual community; fitness clubs; user interaction; customer citizenship behavior; psychological empowerment; sense of community



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1. Introduction

The COVID-19 pandemic prompted a surge in new fitness models. In particular, since the announcement of China's National Fitness Plan (2021–2025) issued in 2021, digital fitness has reached a new level. Virtual community interaction refers to the user engaging in a virtual platform to not only engage in individual behavior (e.g., search, browse, etc.) but also to build social relationships, discuss topics of interest, and share information through mutual communication with others [1]. Virtual community interaction in the field of sports and fitness clubs can break the boundaries of time and space, promote the sharing of knowledge between users with the same interest in fitness in the network space, and promote mutual communication between users, thereby forming a series of behaviors that are conducive to community development, such as sharing and providing suggestions [2,3]. Virtual community interaction is an important theme in today's digital environment. Therefore, it is essential to conduct research and explore virtual communication interaction in this field for citizenship behavior. Previous empirical studies investigated the impact of virtual social interaction on individual outcomes, such as customer in-role behavior [4], customer satisfaction [5], and knowledge sharing [6].

This kind of personal behavior can solve the problems of the serious homogenization of content and the lack of innovation of service content with economic development [7].

After wide dissemination, on the one hand, it can reduce the pressure on the sales expenses of fitness enterprises, on the other hand, it can also promote the popularity of fitness enterprise products and stand out in a market with serious homogeneity. Therefore, it is of great practical significance to promote the customers of fitness enterprises to form citizenship behavior to help enterprises form core competitiveness, enable fitness enterprises to successfully overcome the crisis, further improve market vitality, and promote the development of fitness enterprises and economy. Customer citizenship behavior refers to the behavior where customers voluntarily provide active help and suggestions to other customers, which is beneficial to the enterprise [8]. In recent years, customer citizenship behavior in the service context of the sports industry has attracted the attention of researchers. Guiding virtual community users to generate customer citizenship behavior is an important way to promote the development of virtual fitness club communities [8,9]. To be specific, the development of a virtual community of users engaging in customer citizenship behavior would help customers to create value for the virtual community and maintain community stability [10]; it is also a precious source of new strategic community development ideas [11] that can provide the flexibility to overcome unforeseen problems and promote a positive social environment between members [12–14]. Although the academic community called for expanding the literature field of customer citizenship behavior [15], regarding participatory sports or the fitness service environment, there are few studies on customer participation in value co-creation behavior [16]. In addition, a review of the literature related to sports management showed that user interaction in the virtual community of fitness clubs can have an important impact on customer citizenship behavior through information reciprocity and emotional communication between users [1,17]. However, the specific mechanism of user interaction in virtual communities on customer citizenship behavior is not clear. Therefore, the purpose of this study was to propose a conceptual model and explore the relationship between user interaction and customer citizenship behavior in virtual communities.

Based on social exchange theory [18], not only material resources but also immaterial resources, such as emotions, information, and trust, will be exchanged in the interpersonal communication of social organizations. As a psychological mechanism, psychological empowerment describes the psychological processes and states of a user's ability, influence, self-determination, and meaning in the interaction. Through the intrinsic cognition of virtual community users, psychological empowerment can improve the users' high sense of choice and free sense of control in the process of enjoying services to enhance the customer citizenship behavior of virtual community users. Several scholars believe that psychological empowerment is influenced by user interaction [19], and psychological empowerment can create positive psychological perceptions for individuals to promote their civic behavior [20]. Therefore, we need to further explore the relationship between user interaction and psychological empowerment in a virtual society and how they affect users' citizenship behaviors. In addition, as a special personal emotion, the sense of community exerts influence on users and stimulates their mutual demands [21]. The sense of community is the identity and belongingness emotion of members and the common belief that emotional needs among members can be satisfied [22]. For the users of the virtual communities of sports and fitness clubs, a high level of sense of community can enhance the emotional communication and sense of autonomy among users in the community environment. However, in the existing literature, there are few studies on the role of individual internal psychological mechanisms in the influence of interaction on customer citizenship behavior [23,24], and very few introduce community awareness into the model as a moderating variable.

Through the empirical research on customer citizenship behavior and user interaction, it is found that the research objects include both tangible products and intangible products. Therefore, it is necessary to analyze the internal relationship and mechanism between virtual community user interaction and customer citizenship behavior in fitness clubs (a fitness club with a mixture of tangible and intangible products), in order to explore

the specific impact of virtual community interaction on customer citizenship behavior. This study deepens the depth and breadth of customer citizenship behavior research, enriches the empirical research of social exchange theory, enriches the empirical research of community awareness as a regulating variable, and expands the boundary effect of psychological empowerment.

Therefore, this study investigated a moderated mediation model and proposed that psychological empowerment plays a mediating role in the relationship between user interaction and customer citizenship behavior in a virtual society. The second path from psychological empowerment to customer citizenship behavior was moderated by the user's sense of community (see Figure 1).

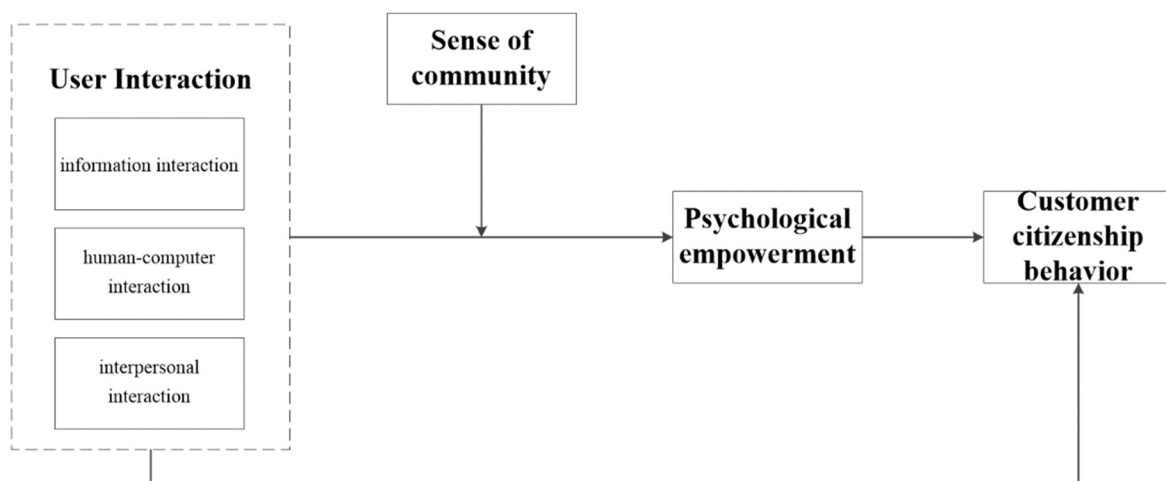


Figure 1. Conceptual model of user interaction and customer citizenship behavior.

2. Theoretical Basis and Hypothesis

2.1. Social Exchange Theory

Social exchange theory points out that all human behaviors are reward and cost-oriented and are rational behaviors of exchange and choice to obtain certain rewards or avoid punishment [25]. Based on the reciprocity principle in the social exchange theory, this study holds that [26] when users interact in virtual communities, they will generate civic behaviors to return to the community because of their own profit or advantage psychology. Therefore, using social exchange theory as the main framework to study civic behavior supported the theoretical model of this study.

Previous studies used social exchange theory as a theoretical lens to link user interaction with enterprise and team outcomes, such as sharing economy [27], cross-cultural communication [28], and consumer behavior and psychology [29], which shows that user interaction will have an important impact on customer behavior choice. Some scholars have proved that the interaction between users has a negative impact on the work-life balance [30], the participation of core users has a positive impact on social behavior and relationships in the digital live application, and the influence of social communication quality between users on customer citizenship behavior [31]. Therefore, this study explored the influencing mechanism of user interaction and customer citizenship behavior from the perspective of social exchange theory, investigated the mediating role of psychological empowerment in the relationship between user interaction and customer citizenship behavior, and analyzed the moderating role of the personal context factor sense of community in the relationship between user interaction and customer citizenship behavior.

2.2. Customer Citizenship Behavior

Customer citizenship behavior is an extra-role behavior that customers voluntarily provide for enterprises [32]. According to users' voluntary and free actions before, during

and after the service transaction, Groth identified three types of customer citizenship behaviors: recommending to friends and family, helping other customers, and providing feedback to the company [11]. Previous studies confirmed that the theory of customer citizenship behavior plays an important role in service value creation [15] and customer loyalty [33]. Therefore, virtual communities are eager to stimulate users to produce civic behaviors to seek community development. Users in the community who are not restricted by region will develop a common sense of support and affirmation for the same product or service. Through rapid communication and exchange, psychological barriers will be broken, and the sense of identity and common belief between users and users and between users and communities will be increased. When discussing a product or service, being affirmed by others will enhance the user's feeling of being "empowered" and encourage the user to recommend the product or service to other users inside and outside the community. At the same time, if users receive more attention and a positive response, they will more actively participate in the interaction and voluntarily provide help and rationalization suggestions [34]. In this way, a virtuous circle is formed, enabling the virtual community to benefit from this environment.

In recent years, scholars made abundant achievements in the research on the antecedents of customer citizenship behavior. Based on customer characteristics, it was found that commitment [35], trust [14], fairness [36], loyalty [37], personal traits [38], and other factors have predictive effects on customer citizenship behavior. From the perspective of other customer characteristics, it was shown that other customers' support [39] and other customers' civic behavior [40] are related to customer citizenship behavior. In addition, service characteristics [36] were also found to be related to customer citizenship behavior, for example, service script [41] and brand attachment [42]. Scholars also found through empirical studies that both employees and organizations have an impact on customer citizenship behavior, for example, organizational citizenship behavior [36], employee commitment, employee credibility, kindness and loyalty [43], organizational support [44], and organizational socialization. At present, scholars divide the dimensions of customer citizenship behavior into three dimensions [36], four dimensions [25], five dimensions [12], eight dimensions [43], and so on. However, when some scholars explore the influencing factors of customer citizenship behavior, they do not divide the dimensions [36], while this study mainly explores the influence of different dimensions of interaction on customer citizenship behavior. Therefore, this study considers customer citizenship behavior as a whole to conduct research.

2.3. User Interaction

User interaction generally exists in the field of innovation (online platforms) [45]. Baron defined user interaction as the behavior that is used to obtain information and meet emotional needs [46]. Libai believed that user interaction in online brand communities lies in the behavior of transmitting information to each other [47]. Bruhn believed that community members can absorb the information, knowledge, and skills they need in the process of interaction [24]. Based on the studies of scholars, this study defined user interaction as the communication activities conducted by users for different purposes and to satisfy different needs in virtual communities. Research shows that user interaction is affected by users' personality characteristics [48], and satisfaction [49]. It also affects prosocial behavior [50], sharing experience [51] and customer identity [52]. Some scholars have proved the intermediary role of information interaction in the relationship between social exchange and innovation speed [13], and that communication between people plays a role in solving burnout and self-care under mental health services [53].

User interaction theory provides a theoretical basis for the generation of users' shared beliefs and empowerment and provides an antecedent explanation for the formation mechanism of customer citizenship behavior. Interaction stimulates users to generate incentive resources that have a positive impact on users so that users can further perceive

or achieve the purpose of joining the community and then conduct behaviors that are beneficial to the community.

2.4. User Interaction and Customer Citizenship Behavior in Virtual Communities

User interaction includes information interaction, human–computer interaction, and interpersonal interaction [14]. Information interaction refers to the exchange of product information and personal experience by users and how to solve related problems in the use of products or services [14]. Information interaction meets the requirements of users to obtain information [54], and is also the most important aspect of business development [55]. For example, while obtaining information, according to the reciprocity principle of social exchange theory, customers will return to the community through civic behavior and promote the development of the community by understanding the products or services and getting corresponding help.

Human–computer interaction emphasizes the interaction of the community, generally referring to the degree of interaction between community users and the platform [13]. With the development of science and technology, the aesthetics of computer pages (navigation) and the convenience of use affect the user’s experience in the community [12]. The use of computer technology as an intermediary allows the community to provide immediate feedback; based on this, social exchange theory states that when a user is convenient, fast, and answers another customer’s questions, the user feels the attention and recognition from other users. In other words, for enhancing the convenience of the experience to bring about a sense of community, customers will voluntarily engage in citizenship behavior.

Interpersonal interaction is the communication between users, where researchers showed the importance of interpersonal interaction research [35]. The interaction between people is important content within the community [shuzi]. The social exchange theory regards the interaction between people as an exchange relationship [56]. In the Internet community, when users have high-quality interactions and create a harmonious atmosphere and positive relationships, the social exchange theory points out that when customers have close interpersonal communication and let others know their self-worth can be satisfied at the same time, based on the principle of reciprocity, this generates repeat customers through positive psychology, thus forming a civic behavior. Based on the aforementioned, the following hypotheses were proposed in this study:

H1a. *Information interaction has a positive impact on customer citizenship behavior.*

H1b. *Human–computer interaction has a positive impact on customer citizenship behavior.*

H1c. *Interpersonal interaction has a positive impact on customer citizenship behavior.*

2.5. The Mediating Role of Psychological Empowerment

Spreitzer defined psychological empowerment as the mental process or state represented in the cognition of ability, influence, self-determination, and meaning, as well as the efficiency and belief regarding completing a certain task [57]. Studies showed that psychological empowerment affects organizational commitment [58], job satisfaction [59], job engagement [60], and customer citizenship behavior [61]. It is also influenced by job characteristics, leadership [62], and other factors. Studies showed that psychological empowerment is a factor that promotes customer citizenship behavior [63], and Kou’s research (2013) identified user interaction as an important antecedent of psychological empowerment, which can further influence brand loyalty. Bernard showed that when an enterprise provides a forum to exchange common interests, customers interact within it, resulting in psychological empowerment, which, in turn, influences brand loyalty [64].

We proposed the idea that psychological empowerment may be an important mediating mechanism of user interaction and customer citizenship behavior. To be specific, the change in the first user’s psychology and behavior is due to the stimulating effect of interaction with the service experience. Based on the stimulation biological response

model, users can feel the decision-making power in the service through a high level of interaction. In the process of interpersonal interaction, human–computer interaction, and information interaction, the second user may form a high degree of control over the quality and outcome of the interaction. At the same time, the interaction between people, between people and machines, and between people and information gives the user the power of choice and control. The existing literature provides empirical evidence for the positive effect of user interaction on psychological empowerment [65].

Today, users emphasize a high degree of choice and free control over the service process in addition to seeking high-quality service. In this case, when users develop a sense of control, self-efficacy, and autonomy when using a service, they will generate and implement civic behaviors [63] in exchange for the benefits they receive in the community. At the same time, user interaction improves the service experience; therefore, if users think they have the power to control the service, they will also consciously take extra-role actions to return to the community [66].

To sum up, user interaction has a positive impact on psychological empowerment, and psychological empowerment has a positive impact on customer citizenship behavior. Therefore, the following hypotheses were proposed in this study:

H2a. *Psychological empowerment mediates the relationship between information interaction and customer citizenship behavior.*

H2b. *Psychological empowerment mediates the relationship between human–computer interaction and customer citizenship behavior.*

H2c. *Psychological empowerment mediates the relationship between interpersonal interaction and customer citizenship behavior.*

2.6. The Moderating Effect of the Sense of Community

The original concept of the sense of community was derived from McMillan's four-element model. He believed that the sense of community is the identity and belonging emotion of members, and the common belief that the emotional needs of community members are satisfied [67]. The sense of community is divided into the following four dimensions: member identity (the sense of belonging or a shared feeling of personal relevance), influence (groups have an important influence on its members), needs to satisfy (a group provides power for its members, encouraging them to participate in the group), and emotional connection (a commitment and belief) [67]. Based on this, this study defined a sense of community as a sense of belonging, community, and shared belief among community members. The sense of community is an important feature of virtual communities [68], and thus, it is essential to explore whether there is a mechanism of action of the sense of community in the relationship between user interaction and psychological empowerment. Empirical research by Ahmad et al. explored the moderating effect of a sense of community on the relationship between community empowerment and project sustainability [69]. Jung et al. proposed that the higher the level of corporate relationship investment, the stronger the positive impact of positive customer interaction on service emotion [31]. This suggests that the influence of user interaction on the outcome variables may be influenced by moderating factors. User interaction is individualized behavior and its interaction efficiency is affected by individual factors. As a special emotion of users toward the community, the sense of community is likely to have a moderating effect on the interaction. Although this study investigated the mediating effect of psychological empowerment, some scholars found a negative impact on the relationship between face-to-face interaction and team empowerment [65]. Therefore, it is necessary to study the boundary effect from user interaction to psychological empowerment. This study explored the moderating mechanism of a sense of community between user interaction and psychological empowerment.

In the process of interaction, users will choose and control the obtained resources according to their own ideas [70], and at the same time, users will have a sense of com-

munity in the process of message or resource exchange [71]. Based on the principle of reciprocity, users generate psychological empowerment during a community interaction, and this exchange process will be affected by the special emotion of the sense of community. Studies showed that when the sense of community describes the relationship between individuals and social structures, customers can feel a stronger sense of community with the enhancement of the interaction [72], and the positive relationship between the sense of community and psychological empowerment was proposed theoretically [73]. Therefore, a sense of community enhances the relationship between user interaction and psychological empowerment.

Some scholars proposed through empirical studies that high-quality communication ability can generate a sense of belonging within the partnership, strengthening user empowerment and the ability to implement interventions in the community [74]. Based on the positive role of the sense of community in the relationship between user interaction and psychological empowerment discussed above, we proposed the following hypotheses:

H3a. *A sense of community plays a moderating role in the relationship between information interaction and psychological empowerment in which enhanced information interaction leads to enhanced psychological empowerment.*

H3b. *A sense of community plays a moderating role in the relationship between interpersonal interaction and psychological empowerment in which interpersonal interaction is enhanced and psychological empowerment is enhanced.*

H3c. *A sense of community plays a moderating role in the relationship between human–computer interaction and psychological empowerment, and enhanced human–computer interaction is associated with enhanced psychological empowerment.*

3. Method

3.1. Measurement

This study's questionnaire consists of two sections. Section 1 is about background and basic information, including the respondent's marital status, age, education, exercise duration, and so on. Section 2 measures the three core variables of "Customer citizenship behavior", "User interaction", "Psychological empowerment", "Sense of community". Likert 5-level scale was used to measure the core variables in this study.

Customer citizenship behavior. This scale was adapted from Groth [11], whose measurement consisted of 11 items, including "Are you willing to introduce the virtual health club community to your family, classmates or colleagues", "Are you willing to recommend the virtual health club community to your family, classmates or colleagues" and "Are you willing to recommend the virtual community of the health club to the people around you who have fitness plans and interest in fitness". The overall reliability was 0.897, indicating a high degree of internal consistency and well-structured measurement of this variable.

User interaction. This scale was derived from Nuan Luo [14]. User interaction included three dimensions: information interaction, human–computer interaction, and interpersonal interaction. Each dimension covered three questions and consisted of nine items in total. The internal consistency reliability coefficients of each dimension were 0.799, 0.771, and 0.788, respectively, and the overall reliability coefficient was 0.879, indicating that the internal consistency of this variable measurement was high and well-structured.

Psychological empowerment. Spreitzer [57] and Newman [62] were referenced when creating the scale, which consisted of 12 items, including "What I do in the virtual community of the health club is important to me" and "my activities in the virtual community of the health club are meaningful to me". The overall reliability was 0.861, indicating a high degree of internal consistency and good structure of the measurement of this variable.

Sense of community. Peterson et al. [75] was used to create the scale, which was divided into eight items, including "I feel that I belong to the virtual community of my health club" and "I feel that I am a member of the virtual community of my health club".

The overall reliability was 0.852, indicating a high degree of internal consistency and good structure of the measurement of this variable.

Control variable. Some scholars believe that citizenship behavior is influenced by personal characteristics. Detert and Burris [76] showed that demographic variables, such as age and education level, have an impact on customer citizenship behavior. Therefore, age and education level were taken as control variables in this study.

3.2. Sample and Data Collection

In this study, convenient sampling method was adopted, and the sample objects were selected from fitness lovers in Southwest China. The questionnaire was distributed online and as an on-site paper questionnaire. Respondents could fill in the questionnaire by scanning the code or hyperlink, each IP address could only fill in one questionnaire to avoid repeated answers, respondents were informed of the purpose of the survey and the procedures for filling out the questionnaire, and all information they provided was guaranteed to be confidential. Moreover, the questionnaire in this study was compiled by drawing on the mature scale of famous scholars, and Likert 5-level scale was used to measure the core variables in this study. In this study, 380 questionnaires were collected from randomly assigned respondents. Seventeen respondents who did not complete the questionnaire were excluded and 363 questionnaires were finally analyzed.

The statistical results showed that there was little difference between the men and women in the sample, but there were more women (53.4%). The respondents aged 18–30 years accounted for 89.3% of the total number of respondents, and the respondents were mainly students (65.6%); therefore, most of the respondents were unmarried (86.2%) and an income below CNY 2000 accounted for 49.6% of respondents. Most of the respondents' time spent on fitness was less than 6 months (49.6%), and the number of fitness sessions per month was 4 times or less (60.9%). The duration of each fitness session was mostly 31 min to 1 h (42.1%).

4. Analyses and Results

4.1. Reliability and Validity

First, this study verifies the validity of the questionnaire. Cronbach's α values are all greater than 0.8, indicating that the data has good validity. The reliability of the sample data is tested through convergence validity, discrimination validity, and confirmatory factor analysis [77].

As shown in Table 1, the AVE mean of each variable is greater than 0.5; the mean CR value is greater than 0.7, indicating that the variables and dimensions of this study have good convergence validity. At the same time, the correlation coefficient of each variable is compared with the square root of AVE.

Table 1. Cronbach's alpha, AVE, and CR.

	Cronbach's α	KMO	CR	AVE
II	0.799	0.711	0.881	0.712
HCI	0.771	0.702	0.868	0.687
ITI	0.788	0.707	0.877	0.703
CCB	0.897	0.880	0.916	0.505
PE	0.861	0.871	0.921	0.500
SOC	0.852	0.907	0.905	0.545

4.2. Descriptive Statistics

As shown in Table 2, the correlation coefficients between variables are smaller than the square root of AVE, indicating good discrimination validity. Finally, AMOS.24 was used to conduct a confirmatory factor analysis on the questionnaire. The hypothetical six factor model (including customer citizenship behavior, information interaction, human-computer

interaction, interpersonal interaction, psychological empowerment, and community awareness) is acceptable for fitting the data.

Table 2. Correlations and square roots of AVE.

	M	SD	Age	Education	II	HCI	ITI	CCB	PE	SOC
Age	2.11	0.43								
Education	3.86	1.56	−0.034							
II	3.61	0.72	0.010	0.060	0.869					
HCI	3.48	0.73	−0.004	0.040	0.617 **	0.862				
ITI	3.49	0.75	0.010	0.401 **	0.454 **	0.700 **	0.867			
CCB	3.72	0.52	0.080	0.070	0.478 **	0.499 **	0.511 **	0.851		
PE	3.45	0.69	0.04	0.06	0.496 **	0.45 **	0.507 **	0.666 **	0.849	
SOC	3.67	0.63	−0.35	0.02	0.51 **	0.672 **	0.665 **	0.527 **	0.506 **	0.787

Note: Numbers in bold represent the square roots of AVE; ** $p < 0.01$; II = Information interaction, HCI = Human-computer interaction, ITI = Interpersonal interaction, CCB = Customer citizenship behavior, PE = Psychological empowerment, SOC = Sense of community.

As shown in Table 3, the model fitting was within the acceptable range, which proved that the convergence validity and discrimination validity of the scale in this study were good, and proved that the reliability of the data was high. The correlation analysis and descriptive statistics results are shown in Table 2, which covers the mean, standard deviation, correlation coefficient between variables, and the square root of AVE. The statistical results showed that all dimensions of user interaction (information interaction, human-computer interaction, interpersonal interaction) were positively correlated with customer citizenship behavior ($r = 0.478, p < 0.01$; $r = 0.499, p < 0.01$; $r = 0.511, p < 0.01$), psychological empowerment ($r = 0.496, p < 0.01$; $r = 0.45, p < 0.01$; $r = 0.507, p < 0.01$) and a sense of community ($r = 0.51, p < 0.01$; $r = 0.672, p < 0.01$; $r = 0.665, p < 0.01$). In addition, psychological empowerment was associated with customer citizenship behavior ($r = 0.666, p < 0.01$). A sense of community was positively correlated with psychological empowerment ($r = 0.506, p < 0.01$), which strengthened the basis of the regression analysis. As shown in Table 4, the VIF values of each variable ranged from one to three and did not exceed five, indicating that this model was not affected by multicollinearity.

Table 3. Results of confirmatory factor analyses.

χ^2/df	RMSEA	CFI	TLI	IFI
2.427	0.063	0.856	0.854	0.857

Table 4. VIF inspection.

Variable	Age	Ed	II	HCI	ITI	PE	SOC
VIF	1.01	1.01	1.82	2.75	2.41	2	2.26

Note: II = Information interaction, HCI = Human-computer interaction, ITI = Interpersonal interaction, CCB = Customer citizenship behavior, PE = Psychological empowerment, SOC = Sense of community.

4.3. Common Method Bias

Based on Harman's one-factor test (Podsakoff and Organ, 1986), the results show that four factors that account for 60.158% of variance are extracted and the first factor accounts for 35.249%. Thus, although the data were collected from the same source, common method bias is not a major contaminant for our results.

4.4. Hypothesis Testing Common Method Bias

As shown in Table 5, M1 was the regression model used to describe the effect of control variables on customer citizenship behavior, while M2, M3, and M4 were the regression models created by adding the independent variable virtual community user interaction, the

dependent variable customer citizenship behavior, and a combination thereof, respectively. According to the results of M2, M3, and M4, the dimensions of the virtual community user interaction were as follows: the coefficients of information interaction, human–computer interaction, and interpersonal interaction were all positive ($\beta = 0.479, p < 0.001, R^2 = 0.234$; $\beta = 0.502, p < 0.001, R^2 = 0.256$; and $\beta = 0.508, p < 0.001, R^2 = 0.264$), indicating that information interaction, human–computer interaction, and interpersonal interaction each had a positive impact on customer citizenship behavior. Therefore, hypotheses H1a, H1b, and H1c were verified.

Table 5. Regression analysis main effects test.

Variable	Customer Citizenship Behavior			
	M1	M2	M3	M4
Control variables				
Age	0.026	0.077	0.083	0.055
Education	−0.128	0.023	0.028	−0.005
The independent variables				
Information interaction		0.479 ***		
Human–computer interaction			0.502 ***	
Interpersonal interaction				0.508 ***
R ²	0.018	0.234	0.256	0.264
ΔR^2	0.012	0.227	0.249	0.257
F	3.275 *	36.588 ***	41.122 ***	42.961 ***

Note: $n = 363$, * $p < 0.05$, *** $p < 0.001$.

As for the test of the mediating effect (see Table 6), first of all, after controlling for age and education level, information interaction, human–computer interaction, and interpersonal interaction were taken as independent variables, and customer citizenship behavior was taken as the dependent variable; then, regression was conducted to obtain M2, M3, and M4. Then, information interaction, human–computer interaction, and interpersonal interaction were taken as independent variables, and psychological empowerment was taken as the dependent variable. M5, M6, and M7 were obtained via regression. Finally, the information interaction, human–computer interaction, interpersonal interaction, and psychological empowerment were put into the model at the same time, and the regression analysis of customer citizenship behavior was conducted. According to the results of the M2, M3, and M4 models, the positive effects of information interaction, human–computer interaction, interpersonal interaction, and customer citizenship behavior were confirmed in the main effects test. According to the results of the M5, M6, and M7 models, the primary terms of information interaction, human–computer interaction, and interpersonal interaction were all positive ($\beta = 0.488, p < 0.001, R^2 = 0.236$, $\beta = 0.442, p < 0.001, R^2 = 0.211$ and $\beta = 0.502, p < 0.001, R^2 = 0.269$), indicating that information interaction, human–computer interaction, and interpersonal interaction had positive effects on psychological empowerment. M8, M9, and M10 were created after joining the intermediary variables information interaction, human–computer interaction, interpersonal interaction, and customer citizenship behavior of the regression model. When compared with M5, M6, and M7, adding customer citizenship behavior after every dimension of user interaction ($\beta = 0.199, p < 0.05, R^2 = 0.480$, $\beta = 0.255, p < 0.05, R^2 = 0.502$, $\beta = 0.23, p < 0.05, R^2 = 0.489$) had a significant positive effect on psychological empowerment, and its coefficients were decreased, which indicated that psychological empowerment played a partial mediating role in the interaction between information interaction, human–computer interaction, interpersonal interaction, and customer citizenship behavior in virtual communities. Therefore, hypotheses H2a, H2b, and H2c were verified.

Table 6. Regression analysis mediating effects test.

Variable	Psychological Empowerment			Customer Citizenship Behavior		
	M5	M6	M7	M8	M9	M10
Control variables						
Age	0.29	0.033	0.006	0.061	0.064	0.051
Education	−0.079	−0.081	−0.018	0.068	0.073	0.055
The independent variables						
Information interaction	0.488 ***			0.199 ***		
Human–computer interaction		0.442 ***			0.255 ***	
Interpersonal interaction			0.502 ***			0.230 ***
Intervening variable						
Psychological empowerment				0.574 ***	0.559 ***	0.555 ***
R ²	0.253	0.211	0.269	0.480	0.502	0.489
ΔR ²	0.236	0.193	0.251	0.300	0.052	0.039
F	40.622 ***	31.978 ***	44.06 ***	82.667 ***	90.205 ***	85.768 ***

Note: $n = 363$, *** $p < 0.001$.

In this study, the intermediary results obtained in the previous article are verified again by the bootstrapping method. If the confidence interval does not contain 0, the intermediary effect is significant. As shown in Table 7, the direct effect value of the information interaction on customer citizenship behavior is (95% CI = 0.099, 0.250), excluding 0, which indicates that the information interaction affects customer citizenship behavior, while the indirect effect value of the information interaction on customer citizenship behavior through psychological empowerment is (95% CI = 0.180, 0.316), excluding 0, which indicates that psychological empowerment plays a mediating role, and partially plays a mediating role, assuming H2a is true. The direct effect value of human–computer interaction on customer citizenship behavior is (95% CI = 0.149, 0.291), excluding 0, indicating that human–computer interaction affects customer citizenship behavior. At the same time, the indirect effect value of human–computer interaction on customer citizenship behavior through psychological empowerment is (95% CI = 0.154, 0.277), excluding 0, indicating that psychological empowerment plays a mediating role and plays a part of the mediating role, assuming H2b is true. The direct effect value of interpersonal interaction on customer citizenship behavior is (95% CI = 0.119, 0.262), excluding 0, which indicates that interpersonal interaction affects customer citizenship behavior. At the same time, the indirect effect value of interpersonal interaction on customer citizenship behavior through psychological empowerment is (95% CI = 0.169, 0.302), excluding 0, which indicates that psychological empowerment plays a mediating role, and partially plays a mediating role, assuming H2c is true. The verification result of the bootstrapping method is consistent with the previous results, which further supports the hypothesis of H2a, H2b, and H2c.

Referring to the views of Ma Hongjia and other scholars, this study did not directly adopt the grouping analysis method, but the hierarchical regression method was used to conduct the adjustment test. For the independent variables, mediating variables, and dependent variables, the mean values of each dimension were used to represent the whole variable and were processed in a centralized manner. In terms of the adjustment, a sense of community was neutralized to form an interaction term with the independent variable. As shown in Tables 6 and 8, M5, M6, and M7 were regression models of user interaction and psychological empowerment in virtual communities. M11, M12, and M13 were regression models of information interaction, human–computer interaction, interpersonal interaction, and a sense of community. Compared with M5, M6, and M7, information interaction ($\beta = 0.215$, $p < 0.05$), human–computer interaction ($\beta = 0.125$, $p < 0.05$), and interpersonal interaction ($\beta = 0.125$, $p < 0.05$) were found to be significantly positive, indicating that there was a positive moderating effect of a sense of community on information interaction, human–computer interaction, interpersonal interaction, and psychological empowerment. Figures 2–4 also showed the impact of each dimension

of virtual interaction on psychological empowerment under the high level of a sense of community.

Table 7. Intermediary effect results test.

Path	Effect	S.E	Boot 95% CI	
			Lower Limit	Upper Limit
Direct effect1 (II-CCB)	0.174	0.038	0.099	0.250
Indirect Effect1 (II-PE-CCB)	0.245	0.034	0.180	0.316
Direct effect2 (HCI-CCB)	0.220	0.036	0.149	0.291
Indirect Effect2 (HCI-PE-CCB)	0.213	0.032	0.154	0.277
Direct effect1 (ITI-CCB)	0.191	0.036	0.119	0.262
Indirect Effect2 (ITI-PE-CCB)	0.232	0.034	0.169	0.302

Table 8. Test of moderating effect.

Variables	M11	M12	M13
Control variables			
Age	0.042	0.053	0.027
Education	−0.077	−0.083	−0.089
The independent variables			
Information interaction	0.319 ***		
Human–computer interaction		0.176 *	
Interpersonal interaction			0.335 ***
Sense of community	0.329 ***	0.379 ***	0.268 ***
Information interaction × Sense of community	0.125 *		
human-computer interaction × Sense of community		0.215 ***	
Interpersonal interaction × Sense of community			0.125 *
R ²	0.355	0.333	0.333
ΔR ²	0.346	0.324	0.324
F	39.343 ***	35.692 ***	35.68 ***

Note: n = 363, * p < 0.05, *** p < 0.001.

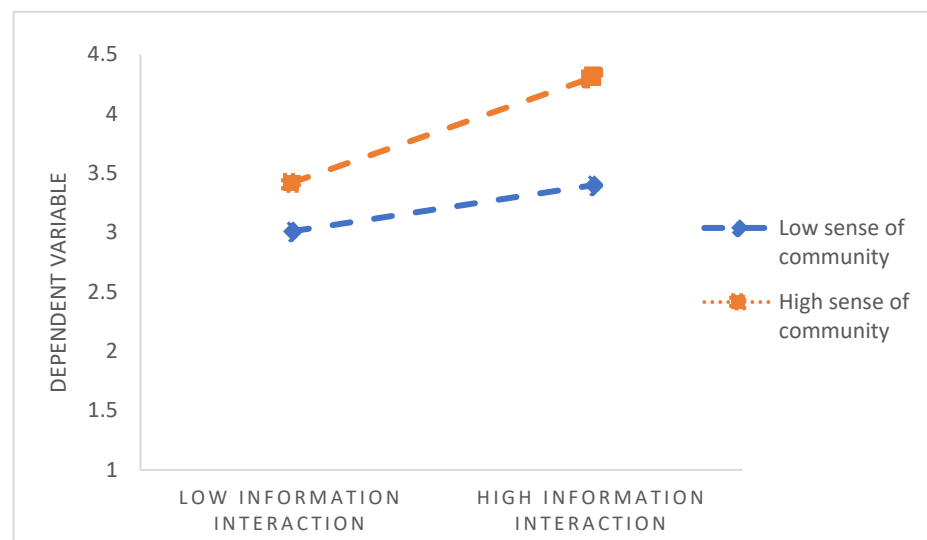


Figure 2. Moderating effect map of information interaction and community consciousness.

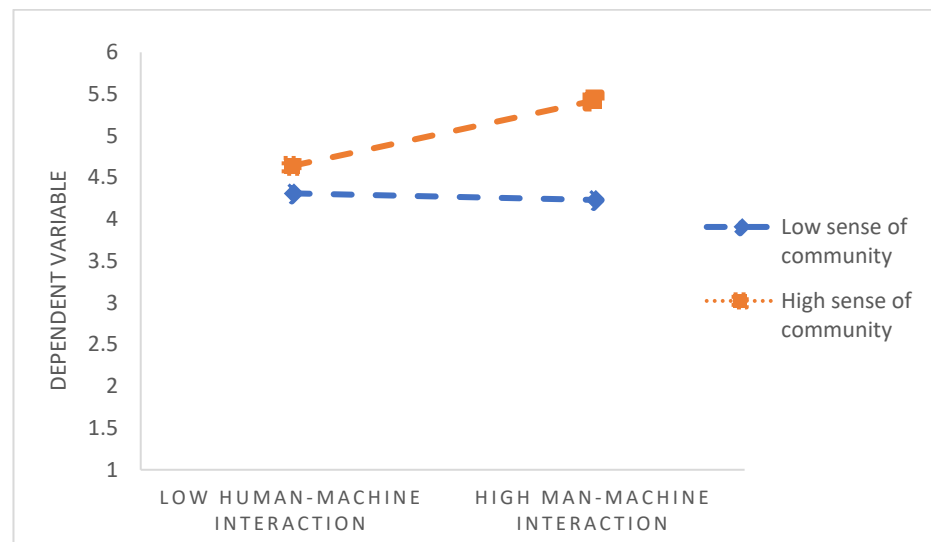


Figure 3. The moderating effect map of human–computer interaction and community consciousness.

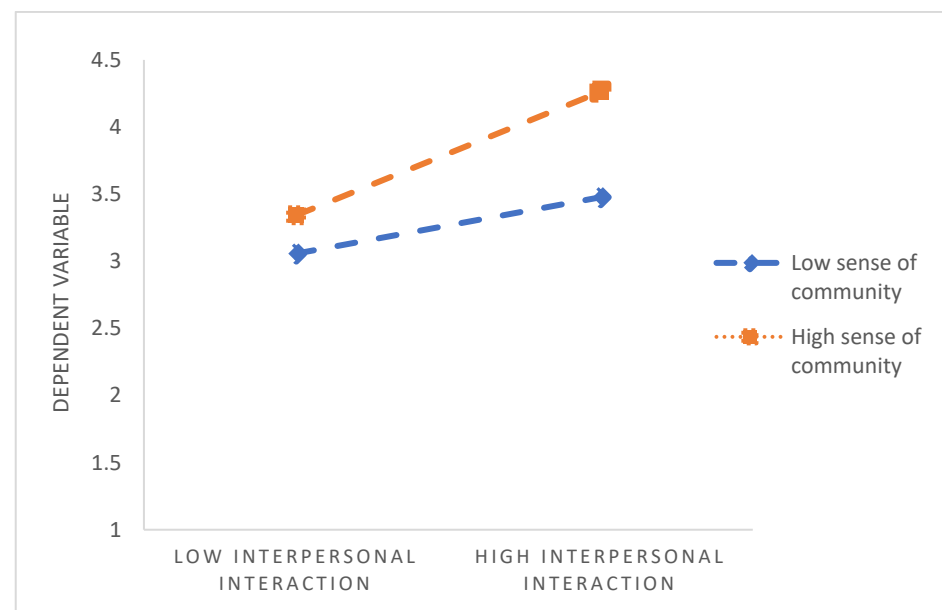


Figure 4. The moderating effect map of interpersonal interaction and community consciousness.

Therefore, Hypotheses H3a, H3b, and H3c were verified.

Using Model 7 in the Process plug-in for verification, the test results show that the mediation effect of each dimension of user interaction is significant (Index = 0.102, 95% CI = 0.0239 to 0.1781, Index = 0.1114, 95% CI = 0.0443 to 0.1759, Index = 0.951, 95% CI = 0.0157 to 0.1773, all excluding 0). The results show that when the support for a sense of community was low, the conditional indirect effect of the information interaction was significant (conditional indirect effect = 0.105, SE = 0.045, 95% CI = 0.013 to 0.192). The results show that when the support for a sense of community was high, the conditional indirect effect of the information interaction was significant (conditional indirect effect = 0.249, SE = 0.044, 95% CI = 0.163 to 0.334). The results show that when the support for a sense of community was low, the conditional indirect effect of human–computer interaction and interpersonal interaction was not significant (conditional indirect effect = 0.026, SE = 0.052, 95% CI = −0.080 to 0.124, conditional indirect effect = 0.085, SE = 0.049, 95% CI = −0.012 to 0.179). Contrarily, when the support for a sense of community was high, the conditional indirect effect of human–computer interaction and interpersonal interaction was significant

(conditional indirect effect = 0.184, SE = 0.043, 95% CI = -0.099 to 0.266 , conditional indirect effect = 0.214, SE = 0.043, 95% CI = -0.134 to 0.305) (see Table 9).

Table 9. Moderating effect results test.

Path	Moderating Effect	Effect	S.E	Boot 95% CI	
				Lower Limit	Upper Limit
II-PE-CB	Low SOC	0.105	0.045	0.013	0.192
	Hight SOC	0.249	0.044	0.163	0.334
HCI-PE-CB	Low SOC	0.026	0.052	-0.080	0.124
	Hight SOC	0.184	0.043	0.099	0.266
ITI-PE-CB	Low SOC	0.085	0.049	-0.012	0.179
	Hight SOC	0.214	0.043	0.134	0.305

5. Discussion

First, our study aimed to understand the relationship between user interaction and customer citizenship behavior in virtual communities using social exchange theory [18,26]. This study built a model based on social exchange theory through scientific theoretical methods, verified the model, and proved the positive impact of user interaction (information interaction, human–computer interaction, interpersonal interaction) on customer citizenship behavior. Lou, based on the uncertainty reduction theory, found that different community interactions (information interaction, human–computer interaction, interpersonal interaction) have different effects on harmonious community relations [14].

The research results show that psychological empowerment plays a part in the relationship between user interaction and customer citizenship behavior. We studied how psychological empowerment affects customer citizenship behavior by influencing the psychological cognitive process of users in virtual communities. In addition, we found that psychological empowerment could partially mediate the relationship between user interaction and customer citizenship behavior in virtual communities. Our results empirically supported the idea that psychological empowerment as a mediator can enhance users' sense of dependence on the organization and their responsibility, thereby influencing their civic behavior [61].

In addition, this study explored the boundary of psychological empowerment on customer citizenship behavior by using a sense of community as a moderating variable. The results showed that a high level of sense of community further strengthened the positive effect of psychological empowerment on customer citizenship behavior. This finding was consistent with previous studies: a sense of community can play a key role in the process of individual empowerment [77]. A high level of sense of community can enhance emotional communication and a sense of autonomy among users in a community environment. By enhancing the sense of belonging of community members, community members' valuable behaviors toward society can be enhanced [78]. In addition, we also found that when users in virtual communities maintained a high level of sense of belonging and free control of the community, user interaction in virtual communities was more significant to the perceived relationship between customer citizenship behaviors through psychological empowerment.

5.1. Theoretical Implications

This study made some theoretical contributions by studying the influence of user interaction on customer citizenship behavior in virtual communities. First, we verified and extended the research of Luo et al., demonstrated that information interaction had a positive impact on the organization by influencing the value behavior of users, and expanded our understanding of the impact of diverse interactions on users in virtual communities. In addition, based on the human resource management context of the sports industry, this study also enriched the literature field of community interaction.

By exploring the mediating role of psychological empowerment in the influence of user interaction on customer citizenship behavior in virtual communities, this study enriched the research on psychological empowerment in the field of customer citizenship behavior from two aspects: user psychological perception and cognition. In addition, the results of this study, to a certain extent, supported the evidence that social exchange theory is an important contributor to psychological empowerment [79]. As mentioned earlier, there has not been much conceptual and empirical exploration of the role of SOC in empowerment based on engagement processes, especially in sports human resource management, in the community psychology, and other disciplinary literature.

Finally, this study examined the moderating role of a sense of community and explored the boundary effect of user interaction in virtual communities on customer citizenship behavior. The results showed that the effects of information interaction, human–computer interaction, and interpersonal interaction on psychological empowerment led to an increase in high social awareness. Further, Zimmerman [80] asserted that the empowerment process is often complex and multifaceted, but few studies have elucidated this ecological nuance. Both participation and SOC are processes that are generally considered to be positively related to empowerment in general. However, our study provided a more detailed understanding of this relationship. In other words, virtual social networks provided by communities can enhance users' sense of belonging and identity through interaction, and thus, enhance users' psychological empowerment. This study extended the research on a sense of community in the field of social exchange theory.

5.2. Practical Implications

Our findings provide some practical implications for managers and decision-makers in the sports industry. First of all, our research results reflected the technical mediating effect of human–computer interactions in a fitness club on the construction of a virtual community network; therefore, community information interaction and interpersonal interaction should be based on human–computer interaction, giving full credence to the role of computers, and thus, allowing users to more quickly and accurately find information at the same time through using data mining and related fitness programs to drive the user experience. Interpersonal interaction has a positive effect on customer citizenship behavior. The community can rely on the influence of fitness information that is shared by active members. On the one hand, more passive members can participate in community interaction, such as releasing fitness information, conducting cloud competitions with friends in the community, and sharing their fitness status to other platforms to attract more users to join the community. The change in passive members also means an increase in community “employees”, from which the community can learn about community construction. Virtual communities act as amplifiers, allowing the community to understand user needs and reach a wider audience. Users also describe their most authentic feelings to the community through it.

Second, our study provided insights into the mediating effects of psychological empowerment on information interaction, human–computer interaction, interpersonal interaction, and customer citizenship behavior. Based on this, the managers of virtual communities in the sports and fitness industry can enhance the psychological empowerment of users through the customization of courses and personalized consumer services so that the community can form unique competitiveness in the minds of users, and thus, enhance the loyalty and unsubstitutability of users to the community.

Third and finally, our research demonstrated that a sense of community, as an emotional mechanism, has boundaries and can deepen the impact of user interaction in virtual communities on customer citizenship behavior. Therefore, managers of virtual communities in the sports industry can create “Internet celebrities punching in videos” similar to shuttlecock exercises, which can be used as a link to connect the group relationships between users and create a belief of “I will work out with everyone” for users. Moreover, when interacting with users of cloud fitness competitions, we regularly organize offline

communication or give benefits in the form of broadcasts, which deepen the users' sense of belonging to the community; tightens the users' relationship with the community, and thus, optimizes the psychological authorization; increases the user-generated citizenship behavior; and provides high-quality virtual community development for the health club.

5.3. Limitations and Future Development

There were some limitations to the study. First, the study used cross-sectional data, which can only show the state of variables at a certain moment but cannot accurately reveal the dynamic relationship. Therefore, it is necessary to conduct longitudinal studies in the future to lay a good foundation for the study of the relationships between the studied variables. Secondly, the sample source is only in the southwest region, and the research scope can be expanded to China in the future. Finally other factors related to customer citizenship behavior in virtual health club communities may also play a role. This study mainly started from the individual psychological state; future research can also introduce external influences such as the community environment and external public opinion to further improve the path of customer citizenship behavior.

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