Understanding antecedents of active product recommendations behaviour in online social networking communities

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Abstract

The intention to promote voluntary product recommendation by individuals in the community during online social contact has aroused more and more interest. At present, in a network community composed of consumers, the reasons for personal active product recommendation by consumers are not obvious. In order to further explore the personal active product recommendation behaviour in the community during online social contact and the key factors that influence this behaviour, we have developed a model that, based on the Cognitive Emotion Theory, examines the reciprocal relationships in the community environment and the emotional impact of community homogeneity on the sense of community belonging and community receptivity, which ultimately influences the subsequent active product recommendation behaviour of individuals. The SEM-PLS technique was used to analyse the data collected from a questionnaire survey of 480 WeChat community users. The results of the study show that good community reciprocity and homogeneity have a positive impact on a sense of community belonging and receptivity, and these factors in turn have a positive impact on active product recommendation behaviour. The implications of these findings for both theory and practice are discussed, including the importance of fostering positive reciprocity and homogeneity in online communities to increase individuals' active product recommendation behaviour. The findings provide insights for online community administrators on how to foster a sense of community belonging and receptivity, which can ultimately lead to a more active and engaged community.

Keywords Cognitive emotion theory · Product recommendation · Community reciprocity · Homophily experience · Community receptivity · Sense of belonging

Introduction

Taking advantage of consumers' desire for social contact, companies have gradually integrated themselves into consumers' social networks, allowing consumers to share information about goods or services, experiences, knowledge and opinions, in addition to chatting, as part of their daily social interactions. In previous studies, online consumer recommendation behaviour and public praise have always been important factors influencing the success of e-commerce (Hur et al., 2011), as they allow people to make friends or meet new friends (Ellison et al., 2007) and exchange views and opinions through the media of text, video and images (Fiedler & Sarstedt, 2014). Recommendations among consumers influence their choice of online products (Casaló et al., 2013; Nambisan & Watt, 2011; Senecal & Nantel, 2004). For many years, many scholars have conducted studies on satisfaction, emotional perception and recommendation intention (Altunel & Erkurt, 2015; Chi & Qu, 2008; Hosany & Prayag, 2013; Prayag et al., 2013, 2017). However, the same results may not occur against the research background of the network community in the context of the previous technological development of the Internet (Simon et al., 2013). The current features and information sharing technologies of the network community can enhance users' recommendation intention in a more effective way (Zhang et al., 2019). Based on the above, this study aims to explore

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the network community factors that influence users' recommendation intention.

In terms of customers' logical decision-making, too much information will hinder their ability to select the optimal option, leading to negative emotional cognition (Lee & Lee, 2004). The creation of consumer behavior is significantly influenced by the community atmosphere, which is a precondition for the views of the community's members (Nambisan & Watt, 2011). Few researchers, however, have looked at the elements that predispose people to actively offer products and services to others in the neighborhood from the perspective of the local environment. Prior research has suggested that online community members can create community reciprocity and homogeneity as cognitive environment cues (Zhang et al., 2019). According to research by Zhang et al. (2019), community atmospheric cues have an impact on future product recommendations based on stimulus-organism response (SOR). Nevertheless, the moderating variable of the "organism" is negative attitude. The term "atmosphere" is used to describe any aspect of the offline or online environment that is regarded as external to the individual, awakens the senses, and, as a result, influences the overall experience of being in a specific location at a specific time, according to Milliman and Fugate (1993) and Koo and Ju (2010). In other words, environmental cues could be thought of as consumer-accessible perceptions (Eroglu et al., 2003; Vrechopoulos & Siomkos, 2002). These characteristics may include communal homogeneity or reciprocity in various circumstances. Community reciprocity, as a sort of ambient cue, affects consumers' purchasing decisions, according to research by Eroglu et al. (2003). Social media users may benefit from community homogeneity as a type of atmospheric signal, and these forms of cognitive atmospheric cues may even uplift mood in a group (Ou et al., 2014). Community homogeneity stimulates consumers' cognitive and emotional states as a type of significant atmospheric cue, which in turn affects their behavioral responses (Sheng & Joginapelly, 2012). The SOR model used in the past is replaced by Cognitive Emotion Theory (CET), and the beneficial effect of emotion has been examined in this study to define the psychological evolutionary stage of "cognition-emotion-behavior." We therefore linked it with the adoption of community receptivity and a sense of community belonging to construct our research and based it on these views in order to fill this vacuum in the CET literature (Algesheimer et al., 2005; Hosany & Prayag, 2013; Ketelaar et al., 2016). Based on the aforementioned justifications, this study investigates how consumer active referral behavior in social communities is influenced by community cognition of emotions.

This study makes three major contributions. First, it takes into account how customers' active personal product recommendations are influenced by the social community atmosphere. In the second section, we introduce a number of social community atmosphere cues as antecedents (community reciprocity, interpersonal interactions, and community homogeneity), and we analyze and explain how these atmosphere cues impact users' internal perceptions in online social communities. Additionally, we look at two mediating concepts: a sense of community receptivity and a sense of community belonging. Third, we have incorporated CET and offer fresh perspectives on how to apply this theory to online consumer behavior.

Literature review and hypothesis development

Cognitive emotion theory

The Cognitive Emotion Theory serves as the theoretical foundation for the study of how cognition affects emotions and subsequent behaviors (CET). According to CET, the human decision-making process is assumed to be carried out by three subprocesses: cognition, emotion, and conduct (Prayag et al., 2013). While a person is performing a range of cognitive tasks to process information, this is the psychological stage known as the cognitive stage (Lu et al., 2014). The person's psychological condition is determined by a cognitive assessment of events or ideas during the emotional cognition stage. Customer loyalty, user purchasing decisions, and active activity have all been found to be influenced by CET. The relevant studies by some researchers in the past are shown in Table 1.

Product recommendation

The e-commerce community, which possesses the traits of a social community, has drawn more attention as one of the primary forms of social commerce. Previous studies by a number of scholars shown that the actions of e-commerce websites that provide suggestion data may affect both the box office sales and customers' online selections. (Senecal & Nantel, 2004; L. Liu et al., 2016; Duan et al., 2008). Nevertheless, since the information supplier and the receiver are typically not in direct touch, it can be challenging for the recipient to assess the validity and quality of the product recommendation made by the information provider on an e-commerce website's online platform (Chatterjee, 2011). In fact, individuals tend to have more faith in information from others who do not have commercial intentions, as it is easier for the latter to be viewed as reliable (Chiu et al., 2007). For instance, people in an online community are

Table 1 Research related to Cognitive Emotion Theory

Prayag et al. (2013)	CET is a theoretical framework for studying the connection between cognition, emotion, and behavior in individuals.
Lu et al. (2014)	The cognitive stage of CET refers to the psychological state in which an individual processes information.
Hosany and Prayag (2013)	It is reasonable to suppose that beliefs come before emotions since emotions are a byproduct of cognitions (beliefs) and motives (desires).
Verhagen and Van Dolen (2011)	Emotions lead to consumer behavior tendency.
Wang and Chang (2013)	CET influences user purchase decisions.
Chen and Shen (2015)	CET influences customer loyalty.
H. Liu et al. (2016)	Community atmosphere, a type of user cognition, is considered in CET.
Loureiro and Roschk (2014)	Community atmosphere can be perceived by users in the community.
Mazaheri et al. (2014)	Users are able to sense the community atmosphere, which includes reciprocity and homogeneity.
Elliot and Thrash (2002)	Positive emotions are associated with active behavior.
Watson et al. (1999)	Positive emotions enable individuals to go beyond their duties.

likely to have a high degree of confidence in a product if they suggest it to other users.

In social network communities, user behavior that involves making recommendations is largely voluntary and stems from the individual user (Pai & Tsai, 2016; Yang, 2013). In this instance, spreading supportive information among users who are not working for commercial social media platforms constitutes the behavior of product recommendation (Lee et al., 2012). To earn psychological gratification and acknowledgment from the society, as well as to fortify relationships and mutual trust, individuals may promote a good or service (Chu & Kim, 2011; Hau & Kim, 2011). The fundamental requirement for independent product recommendation by users in network communities should be that information suppliers spontaneously view their efforts as necessary and may be rewarded by information recipients (Sun et al., 2006).

Perceived community receptivity and product recommendation

The idea of community receptivity has been put up by several researchers and is regarded to have a substantial impact on how successfully online communities function (Blanchard, 2007; Blanchard & Markus, 2004; Casaló et al., 2010; Algesheimer et al., 2005) viewed it as a sense of identity perceived by the community and pride in being a member of it based on community receptivity. According to several studies (Casaló et al., 2010; Dholakia et al., 2004;

Shen et al., 2011), community receptivity also plays a role in the pleasant interactions that users have with other users of virtual communities, enabling them to take part more actively in the community.

In a network community setting, it is feasible to affect people's behavior by providing important information or arousing strong feelings (Lindenberg, 2012). The following network behavior of the sender may be impacted in the social network environment when the information receiver assesses the information provided by others (Batenburg & Bartels, 2017). Users often stop participating in community events when they are unfamiliar with the culture of an online community and others do not respond to their communications (Krupka & Weber, 2009; Valeri & Baggio, 2021) hypothesized that the network structure of travel agencies was often disconnected and inefficient, primarily because collaborative activities were not done to a great degree (or inclination). Online communities exhibit perceived community responsiveness in a variety of ways. For instance, when people are complimented by others, they respond favorably (Wiesenfeld et al., 2007). The survival and expansion of destinations, as well as the even and continuous performance of the tourism industry, are all reliant on the effective dissemination of information, contend Valeri and Baggio (2022). As a result, when a community fosters an environment that permits the free expression of viewpoints, member activity rises (Chan et al., 2014). A greater perception of community openness lowers members' social risk. Users are less hesitant to advise their friends in the community about pertinent products or services when they perceive others to be kind and transparent. Conversely, if there is a lack of receptivity in the community, members will make a careful decision on whether it is appropriate to make recommendations (Zhang et al., 2019). Thus, this study propose the following hypothesis:

H1 Community receptivity has a positive impact on users' product recommendation behaviour.

Perceived sense of community belonging and recommendation behaviour

The sense of belonging to a community refers to the degree of closeness or acceptance by others in social relationships (Graham, 1995). Previous experimental studies conducted by scholars have confirmed the influence of emotions on individual behaviour (Guéguen & Jacob, 2013). The sense of belonging to a community, as a kind of perceived community emotion, has an impact on users' product recommendation behaviour.

When users do not experience a sense of community belonging in an online community, it means that they know little about others in the community. It is not possible for them to clearly know the motivations, preferences and intentions of other members, and as a result they tend to stay at arm's length in their interactions. In contrast, those who participate in online communities have a strong feeling of belonging, which suggests that they have a close connection and a greater level of understanding, share similar beliefs and a wide range of interests, and are well acquainted with one another (Johar, 2005). Particularly in the social contact environment of the Internet, a strong sense of community belonging can encourage frequent social contact, making it easier for community members to communicate their views. Therefore, a sense of belonging to a community influences people's behaviour (Shi et al., 2012). The stronger the sense of belonging and the more they believe that others recognise and understand them well, the easier it is for community members to propose their own views, share experiences and actively make recommendations (Burgoon et al., 1999). The motivation for consumers to share information is to feel a sense of belonging with community members and to share common goals and visions with other members (Phelps et al., 2004). Therefore, we propose the following hypothesis:

H2 The sense of community belonging has a positive impact on users' product recommendation behaviour.

Cognitive factors and community receptivity

Researchers believe that the idea of reciprocity is crucial when exploring how people in a social system share and exchange resources (Burgoon et al., 1999). Some academics contend that rather than relying on direct rewards, reciprocity involves gaining indirect benefits from social engagement with others (Pai & Tsai, 2016). In this study, community reciprocity was defined according to Chang and Chuang's (2011) work as people's perception of fairness when they share information, experiences, and other things with one another in a social network community. High reciprocity deepens interpersonal ties, which establishes the framework for satisfying group connections (Hoppner et al., 2015). Consumer incentive to engage in social interaction and teamwork is stimulated by how intense consumer reciprocity is, which encourages community receptivity (Algesheimer et al., 2005). According to several research, people who reciprocate with one another in a community are more likely to be receptive to suggestions from others and to offer helpful responses (Pai & Tsai, 2016; Wasko & Faraj, 2005).

A study by Wang and Chiang (2009) found that community reciprocity influences users' shared vision of the

community, which in turn influences their subsequent use of network communities. According to Chiu et al. (2006), community reciprocity allows community members to share their interests, goals, and ideas with other community members, thereby increasing recognition among members. Therefore, we propose the following hypothesis:

H3 Community reciprocity has a positive impact on community receptivity.

Social groups provide a social technological arena where users are motivated to participate by shared identities, and network social groups basically alter how people choose to connect and collaborate (Kapoor et al., 2018). According to previous research, community homogeneity is determined by people's values, beliefs, social standing, and degree of shared interests (McPherson et al., 2001). In a social network, community receptivity is what makes people feel like their individual traits fit in the group (Ruyter & Conroy, 2002). It's harder to build receptivity in online communities than it is in real interpersonal interactions. The members of a virtual community must therefore perceive one another as homogeneous in order to identify with the community and develop a relationship of mutual receptivity in the cyber world (Wang & Emurian, 2005). According to the congeneric principle, people are more eager to form relationships with those who are like them than those who are different from them (McPherson et al., 2001). People feel emotionally connected to others when they have traits in common with a reference group. They also feel more at ease there and are more open to social interactions (Karantinou & Hogg, 2001). According to research, users in a community are more likely to receive information from their peers than from outsiders because repeated contacts with people who have similar interests can strengthen emotional bonds and subsequently increase receptivity (Shareef et al., 2017). Users who identify as homophiles in a group are more likely to provide information about pertinent products and show better tolerance for other group members (Phua et al., 2017). When community content and activities are aligned with user preferences, they experience a sense of shared identity, which can lead to a stronger sense of receptivity (Martins & Patrício, 2013). Members of the community believe that there are others like themselves living there, and therefore they identify with the community (Park & Chung, 2011). According to Algesheimer et al. (2005), people who participate in virtual community activities (such community-based online gaming) are more likely to identify with the community since they are more eager to express themselves because of their shared characteristics. Thus, we propose the following hypothesis:

H4 Community homogeneity has a positive impact on community receptivity.

Cognitive factors and perceived sense of belonging

Individual consumer behavior in the virtual network community influences how individuals feel about the community and how others perceive them (Chang & Chuang, 2011). According to Mathwick et al. (2008), reciprocity considerably raises the sense of belonging to the community. According to Algesheimer et al. (2005), when consumers are willing to help other community members and actively participate in community activities, members can become emotionally attached to a group based on their personal attitudes.

Prior research on the online environment has generally concentrated on reciprocity, groups of families with similar traits, and members' feelings of belonging (Chan & Li, 2010; Dholakia et al., 2004; Kozinets, 1999; Mathwick et al., 2008; Rosenbaum & Massiah, 2007). People are largely strangers to each other in online social network communities that lack explicit standards of reciprocity and do not want to become closer friends; as a result, the community is unlikely to foster a sense of belonging. Members of a community with a culture of reciprocity may feel a sense of responsibility to share details about their distinctive experiences for the benefit of one another and may also feel a sense of belonging (Ren et al., 2007). Furthermore, individuals are more likely to participate in the community and create a sense of belonging when they believe that community members can demonstrate mutual reciprocity and receive mutual benefits (Fisher, 2002; Hau & Kim, 2011) found that one of the factors influencing community members' sense of belonging to the group is the mutual reciprocity of the community. Therefore, given that members receive more psychological satisfaction when they perceive reciprocity, people's beliefs and habitual expectation of mutual reciprocity influence product recommendation behaviour through a sense of belonging. Therefore, we propose the following hypothesis:

H5 Community reciprocity has a positive effect on perceived sense of belonging.

A sense of homogeneity will cause a change in people's perceptions (Bohnet, 1999; Sproull & Kiesler, 1992). This sense refers to the degree of consistency or similarity in attributes when individuals interact with each other, and is closely related to the concept of interpersonal similarity (Graham, 1995; Mathwick et al., 2008). The hypothesis that community homogeneity creates social closeness lays a basis for studying the process of comparing intimacy with

– and estrangement from – others with others (Rothaermel & Sugiyama, 2001; Sproull & Kiesler, 1992). The more dissimilar another person is from oneself, the more estranged they will seem to be with regard to social contact (Bohnet, 1999; Rothaermel & Sugiyama, 2001). Therefore, the behaviour of another dissimilar party (i.e. one with greater social distance) requires a higher level of understanding than the behaviour of another similar party (i.e. one with closer social connection) (Kim et al., 2016; Su et al., 2015). Based on Hernández-Ortega's (2018) research, it can be inferred that when the experiential comments align with the receiver's personal life, the receiver engages in a self-referential information evaluation. This process results in heightened emotional intensity and a perceived sense of similarity with the reviewer's psychological sensibility. Consequently, the receiver experiences a greater sense of belonging. People also tend to develop more homogeneous feelings towards those whom they feel are more like themselves (Rotemberg, 2009), and there is quite a lot of evidence showing that the sense of homogeneity is strongly associated with the sense of belonging (Andreoni & Rao, 2011; Preston & De Waal, 2002; Su et al., 2015) have found that in the context of SNS, similarity of interests is a key driving factor that makes consumers experience a sense of belonging to the hotel brand. People also develop more empathy towards those whom they feel are more like themselves (Hernández-Ortega, 2018; Rotemberg, 2009), and there is quite a lot of evidence showing that empathy is strongly associated with altruistic and prosocial behaviour (Andreoni & Rao, 2011; Preston & De Waal, 2002), which plays an important role in developing a sense of belonging (Jiang et al., 2010). Thus, we propose the following hypothesis:

H6 Community homogeneity has a positive effect on perceived sense of belonging.

Figure 1 depicts the research model for this study based on the previous pertinent theoretical discussion and hypothesis inference.

Methodology

Data collection

Our research focused on a community of users who utilize the 'WeChat in China' software application developed by Tencent Holdings Ltd. This community was selected as the test population for our hypotheses. With the emergence of the mobile Internet, mobile social applications, such as WeChat, provide convenient communication services. WeChat as a result has grown significantly in popularity
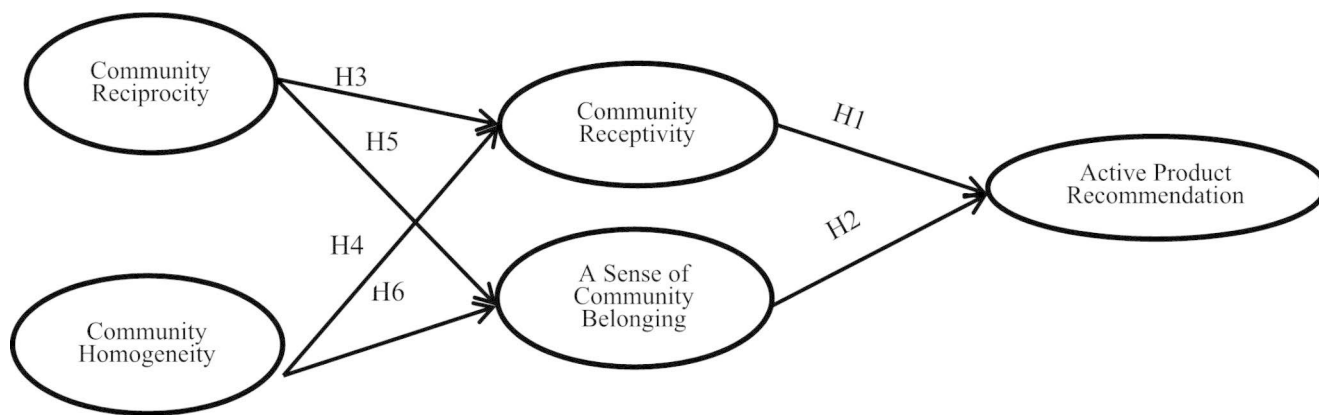
Fig. 1 Research framework

and is today the most widely used social networking site in China. Based on computer-based communication, it has grown to be a significant social media platform for communication (Lien & Cao, 2014). WeChat allows users to create a variety of online communities, and an increasing number of companies have realized the value of communication and interaction among WeChat users for carrying out marketing operations and influencing users' behavior by utilizing the environment in the online community.

Purposive sampling, often known as non-probability sampling, is the sample strategy used in this study. With this approach, the researcher chooses a sample based on specific standards that are thought to be crucial for the study's goals. The sample group for this study was chosen from consumer electronics WeChat groups, and it consisted of 480 individuals from six WeChat communities. While probability sampling is considered the more preferred method for data collection, non-probability sampling can still provide reliable results if the sample is carefully selected and well-representative of the population. In this study, the authors made an effort to minimize potential sampling errors by selecting the network community of consumer electronics and ensuring that the sample size was large enough. However, it is important to note that the results of this study cannot be generalized to other populations without caution, as the sample was not selected randomly. Further research using probability sampling methods is needed to confirm the findings of this study and to determine the generalizability of the results.

The questionnaire samples were administered to, and collected from six WeChat communities with more than 300 people. Respondents were asked to recall their voluntary recommendation behaviour in WeChat communities, and then to complete survey items based on their own experience. The response period ran from November to December in 2020. A total of 500 samples were collected, and overall, 480 valid questionnaires were obtained after excluding 20

copies of either scribbled invalid questionnaires, or those where the responses were too consistent. Male respondents accounted for 51.3% of the population, while the proportion of females respondents was slightly lower at 48.7%; there were 200 people aged between 21 and 30 years, representing the largest age group (41.6%), followed by 164 people aged between 31 and 40 (34.2%); together, these two groups accounted for about 75.8% of the sample, which is similar to the dominant group of Internet users in China, who are aged between 21 and 40. The proportion of study participants whose education level was above college level was 94.2%. The proportion whose income was between CNY 5001 and 8000 was the largest, totalling 211 participants (44.0%), and this was followed by the income group whose income was greater than CNY 8001, which was comprised of 158 participants (33.1%).

The ANOVA model's findings indicate that there is no statistically significant interaction between age and the variables that affect social media addiction, including active product recommendations, community receptivity, a sense of belonging, community reciprocity, and homophily experience.

Age and other factors in the research framework suggest that the respondents' ages did not have a major impact on the outcomes of the data analysis. To further reinforce the validity of the results, it would be advantageous to take age into account as a control variable in future studies. Age can still have an impact on how someone behaves and perceives the world. Regardless of the participants' ages, this study offers insightful information on the critical elements that affect active product referral behavior in online social communities.

We followed Armstrong and Overton's (1977) advice and divided the recalled questions into two categories depending on their response timing, namely early and late, to reduce any potential bias coming from a difference in response rates between recalled and unrecalled questionnaires. We

next ran tests to see if there were any statistically significant variations in the study dimensions and sample data between the two groups. According to the verification results, there were no appreciable variations between the primary dimensions and the fundamental data. These results imply that the potential non-response bias problem was not serious.

In our study's data analysis, we used the partial least squares (PLS) variance-based latent variable structural equation modeling (SEM) technique (Smart PLS 3.0). PLS-SEM is favoured over CB-maximum SEM's likelihood method because it can estimate more complex models with smaller sample sets and does not require the assumption of a normal distribution (Hair et al., 2019). Thus, these advantages of PLS-SEM prove that it is suitable for our investigation.

Measures

The scales used in this study were all adapted or modified in accordance with relevant literature and in line with the questions and situations of this study. Items measuring active recommendation behaviour were adapted from Yang (2013), items measuring community receptivity from Pai and Tsai (2016), items measuring the sense of belonging from Hernández-Ortega (2018), items measuring community reciprocity from Chang and Chuang (2011) and Diep et al. (2016), and items measuring homophily experience from Brown et al. (2007).

Analysis strategy

To achieve precise and rigorous analysis results, this study utilized several research tools appropriate for the research framework and the content being analyzed. Specifically, this study employed both a measurement model and a structural model. The measurement model involved the use of AMOS 23.0 for confirmatory factor analysis (CFA) to assess the scale's convergent validity and discriminant validity. Furthermore, based on existing scholarship, PLS-SEM is believed to be more suitable than CB-SEM for estimating more intricate models with smaller sample sizes (Hair et al., 2019; Khan et al., 2019; Shiau et al., 2019). PLS-SEM is preferred over CB-SEM in the case of the following factors: exploratory research for theory development, prediction analysis, complex structural models, formative constructs in structural models, non-normal distribution, and the requirement of latent variable scores for subsequent analysis (Gefen et al., 2011; Hair et al., 2019; Khan et al., 2019; Shiau & Chau, 2016). Thus, to verify the hypotheses and facilitate the comparative analysis of this study, Smart-PLS was adopted for PLS-SEM in the structural model.

Results and analysis

Evaluation of measurement model

Two steps of the data analysis process were completed. As per the recommendations of HAIR JUNIOR et al. (1998), the measurement model's validity and reliability were first evaluated, then the structural model was examined to assess the study hypotheses. SmartPLS3.0 and SPSS 25's latent variable structural equation modeling (SEM) approaches were used in this investigation. The analysis's findings are shown in Table 2, which also includes the average number, factor loading, reliability, and average variance extracted (AVE) value for each construct used in this study. Researchers typically employ statistical techniques like cross-loading analysis, factor analysis, and correlation matrix analysis to examine the discriminant validity of variables. By comparing the square root of the average variance extracted (AVE) for each construct to the inter-construct correlations, it is possible to assess the value or results of discriminant validity. The construct under examination is distinct from related components and has enough discriminant validity if the AVE value is higher than the inter-construct correlation. Each construct in this study had a composite reliability (CR) that varied from.921 to.963, and every construct's Cronbach's alpha (α) was better than 0.7, suggesting strong reliability. The constructs in this study exhibited factor loadings ranging from 0.714 to 0.940, all of which exceeded 0.500. Additionally, the AVE for each construct ranged from 0.791 to 0.897, surpassing the 0.500 threshold, thereby indicating strong convergent validity. In Table 3, the correlation coefficient matrix for each construct in the study is presented. The constructs in this study exhibited good discriminant validity, as evidenced by the square root of the AVE value for each construct exceeding the correlation coefficient for the dimensions (Chin, 1998). Additionally, the heterotrait-monotrait ratio (HTMT) of correlations based on the multitrait-multimethod matrix, proposed by Henseler et al. (2016), was used to evaluate discriminant validity. As illustrated in Table 4, all HTMT values for the constructs were below 0.9, indicating strong discriminant validity. Based on this analysis, it can be concluded that the study exhibited robust construct validity.

Verification of structural model

SmartPLS3.0 was adopted to test the structural model as this module-based approach not only meets the minimum requirements for sample size and residual distribution but also can handle formative and reflexive structures (Henseler et al., 2016). We adopted SRMR criteria to evaluate the goodness of fit for the model. In our case, the SRMR was

Table 2 Analysis of Construct Reliability and Validity

Construct	Mean	SD	Factor Loading	α	CR	AVE
Active Product Recommendation	3.588	0.993		0.925	0.947	0.817
1	3.411		0.834			
2	3.511		0.915			
3	3.700		0.939			
4	3.700		0.925			
Community Receptivity	3.765	0.838		0.871	0.921	0.795
1	3.789		0.919			
2	3.583		0.895			
3	3.922		0.859			
A sense of Community Belonging	3.776	0.881		0.918	0.948	0.860
1	3.922		0.950			
2	3.806		0.949			
3	3.600		0.881			
Community Reciprocity	3.961	0.981		0.943	0.963	0.897
1	3.944		0.958			
2	3.989		0.951			
3	3.950		0.932			
Community Homogeneity	3.550	0.844		0.903	0.939	0.838
1	3.389		0.872			
2	3.572		0.938			
3	3.689		0.935			

Note: SD: Standard deviation; CR: Composite Reliability; AVE: Average Variance

Table 3 Matrix of Construct Correlation Coefficients

Constructs	1	2	3	4	5
1. Active Product Recommendation	0.904				
2. Community Reciprocity	0.663	0.947			
3. Community Receptivity	0.692	0.792	0.891		
4. Community Homogeneity	0.583	0.613	0.690	0.915	
5. A Sense of Community Belonging	0.650	0.706	0.813	0.732	0.927

Notes: (1) The diagonal line is the square root of the average variance extracted (AVE) of each dimension

Table 4 Heterotrait-monotrait (HTMT)

Constructs	1	2	3	4	5
1.Active Product Recommendation					
2.Community Reciprocity	0.701				
3.Community Receptivity	0.766	0.772			
4.Community Homogeneity	0.636	0.661	0.775		
5.A Sense of Community Belonging	0.696	0.758	0.810	0.802	

0.062, which is less than the value of 0.08 proposed by Henseler et al. (2016) showing a satisfactory model fitting.

Following satisfactory evaluation and measurement results, we proceeded to assess the structural model and scrutinize the hypotheses by examining the percentage of variance and significance of the structural path. Figure 2 shows the test results of the PLS analysis containing control variables. Community reciprocity ($\beta = 0.412$, $p < 0.001$) and

community homogeneity ($\beta = 0.479$, $p < 0.001$) were positively correlated with community receptivity, thus supporting H3 and H4. Community reciprocity ($\beta = 0.591$, $p < 0.001$) and community homogeneity ($\beta = 0.327$, $p < 0.001$) had a significant positive correlation with the sense of community belonging, thus supporting H5 and H6. Community receptivity ($\beta = 0.259$, $p < 0.01$) and the sense of community belonging ($\beta = 0.481$, $p < 0.05$) were positively correlated with independent product recommendation, thus supporting H1 and H2.

Testing of mediating effects

Table 5 presents the normalized effect values of direct, indirect, and total effects for the facets, which were then used to verify the mediating effects. The path coefficients of the indirect effect of community reciprocity on product recommendation through sense of community belonging and community receptivity were found to be 0.107 and 0.284, respectively. Similarly, the path coefficients of the indirect effect of community homogeneity on product recommendation through sense of community belonging and community receptivity were 0.124 and 0.157. Following Shrout and Bolger's (2002) recommendations, we used the ratio of indirect effect as an evaluation index to assess the intensity of the indirect effect. The results indicated that the indirect effect was substantial, highlighting its importance in confirming the mediating effects of community receptivity and sense of community belonging in the relationship among
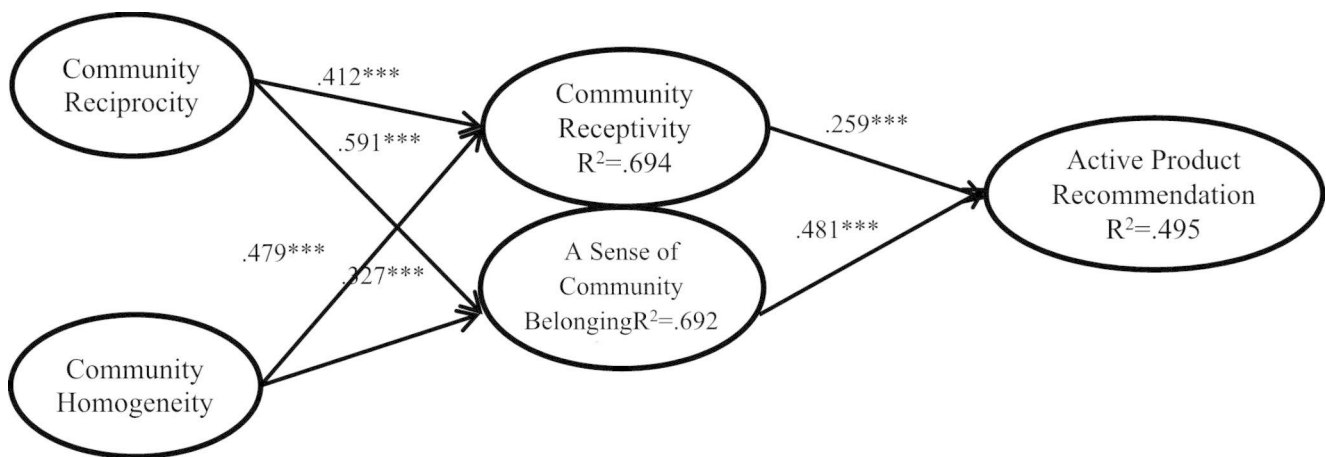
Fig. 2 SEM analysis of the research model

Table 5 Path coefficient of indirect effects

Paths	Indirect effect	T-value	P-value
Community Reciprocity→Community Receptivity→ Active Product Recommendation	0.107	1.733	0.083
Community Reciprocity→A Sense of Community Belonging→Active Product Recommendation	0.284	2.745	0.083
Community Homogeneity→Community Receptivity→Active Product Recommendation	0.124	1.890	0.059
Community Homogeneity→A Sense of Community Belonging→Active Product Recommendation	0.157	2.745	0.006

community reciprocity, community homogeneity, and product recommendation.

Conclusions and discussion

Discussion

According to the study's findings, community homogeneity and reciprocity foster a stronger sense of community acceptance and belonging, which in turn has a beneficial effect on active product endorsement behavior. By emphasizing the significance of emotional attitudes in the success of online communities, the study has contributed to the body of current literature. The idea of community reciprocity, which was developed in this study, refers to the degree of community members' understanding of fairness and how that affects their willingness to actively suggest products to others. The findings of this study are in line with those of other studies, such as that carried out by Zhang et al. (2019), and despite the diverse theoretical models used, our findings

support the notion that the network community's history has a major influence on product suggestion. In contrast to Zhang et al. (2019)'s findings, this study confirms the benefits of a sense of community receptivity and community belonging in network communities, showing that pleasant emotions are conducive to producing positive and particular product recommendation behavior. The existing work on cognitive emotion is also enhanced by the significance of emotional attitude in social behavior (Hosany & Prayag, 2013; Verhagen & Van Dolen, 2011; Wang & Chang, 2013). For example, Yang et al. (2017) found that in online communities, perceived freedom of speech has a positive effect on members' positive behaviour. All of these findings highlight the importance of community atmosphere, which is a critical factor in the success of online communities. Despite the fact that the factors we found in this study are only a part of emotional attitudes, they have revealed this new phenomenon and serve as a precursor to identifying other emotional attitudes. Thus, these factors are crucial for understanding product recommendation behaviour in the context of social media.

This study has contributed to the concept of community reciprocity, which represents members' perceptions of fairness in the community. Some scholars have pointed out that reciprocity reflects "an individual's sense of fairness when sharing content with each other in a virtual community" and represents the individual's sense of helping others (Chang & Chuang, 2011). In contrast to Pai and Tsai's (2016) investigation on identifying factors that facilitate individual reciprocity through a belief in aiding others in the community and a sense of obligation, our study regards reciprocity as a form of perceived information. We find that community reciprocity plays a pivotal and direct role in determining members' active product recommendation behavior in social software applications, thereby highlighting a departure from previous research that explored the reciprocity effect.

Practical implications

However, despite the growing attention given to the role of online communities in influencing consumer behavior, the underlying mechanism of active product recommendation in these communities remains unclear. This study fills this gap by focusing on the key factors that influence consumers' active product recommendation behavior in online communities, specifically the impact of community reciprocity and community homogeneity on the sense of community belonging and community receptivity. The results of this study provide valuable insights into how online communities can effectively promote product recommendations among its members, and highlight the importance of creating a positive community environment in which users feel a sense of belonging and are receptive to product information shared by others. There is also strong evidence from previous studies showing that personal, but unrelated, communication can significantly undermine active behaviour (Buchan et al., 2006).

For online community administrators, this study can provide insights into how to create a welcoming and engaging community environment that will encourage members to participate and recommend products. For example, administrators can integrate various communication functions and tools that are conducive to group communication and encourage social interaction among members. They can also consider implementing labeling tools to help members manage similarities and trigger a sense of close connection in the community. For technology developers, the results can inform the development of new features and tools that will enhance the sense of belonging and receptivity in online communities. For example, developers can consider creating new features that will facilitate communication and interaction among members, such as group video chats or social-network games. For marketers, the results of this study can be used to understand the factors that influence active product recommendation behavior in online communities. By leveraging these findings, marketers can develop more effective strategies for promoting products and building brand loyalty among online community members.

In addition, community homogeneity is an important antecedent for the sense of belonging and receptivity. The implications of our study suggest that online community administrators should focus on creating a sense of belonging and receptivity among their members. By doing so, they can increase the likelihood of active product recommendation behavior within their community. To create a sense of belonging, administrators should encourage social connections between members by integrating multiple communication functions and tools that promote group communication. Additionally, they should consider developing labelling tools that help members manage similarities and identify with positive values, as this can contribute to the disambiguation of the community and enhance feelings of belonging. Social objects are ambiguous in nature and can be constructed through a social process (Ashforth & Humphrey, 1995). Users label different types of communities and selectively assign identities with positive values to people they like, which contributes to disambiguation, and making the perceived community environment more significant. Moreover, once labelled, people often perceive the community on the basis of the type of label (Ashforth & Humphrey, 1997). For instance, labelling a community as 'intimate friends' not only indicates users' feelings about each other, but also enhances these feelings.

Moreover, it is crucial for community administrators to properly manage the intentions of mutual benefit and reciprocity, as well as control the emotional effect in the community. This will contribute to the cultivation of long-term community relationships and the creation of commercial value. The emotional trigger for active voluntary behavior is rooted in the communication and exchange between community members, therefore administrators should prioritize managing good interpersonal relationships. Overall, the study highlights the importance of fostering positive emotions in virtual communities as this can lead to active behavior and popularity, which in turn has the potential to drive the development of the community. Community administrators should aim to not only attract the attention of users but also provide incentives for members to actively share community information. Therefore, for the management of virtual communities, to establish a successful virtual community it is necessary to not only attract the attention of net users but also to provide enough incentives for community readers to actively share community information (Ho & Dempsey, 2010). In terms of implications, the findings of this study can provide useful information for online community administrators who are looking to improve their members' active product recommendation behavior. The importance of a sense of belonging and receptivity, as well as homogeneity, in influencing behavior can help administrators to create a more welcoming and engaging community environment.

Limitations and subsequent studies

This study has several limitations, just as any empirical ones. The sample size and demographic representation are the first constraint because they may not be representative of all WeChat users. The study may not generalize to other online groups since it primarily focuses on the WeChat platform.

Second, this study has shown that community receptivity and a sense of belonging have an immediate influence on the behavior of independent product recommenders. In reality, some contextual factors, including interpersonal arousal, frankness, and perceived knowledge, may also affect social networking sites (Koo & Ju, 2010; Liu et al., 2016; Luo & Zhong, 2015). In the future, studies might examine how additional environmental cues affect how people make product recommendations. According to some experts, the type of online community has an impact on users' emotions and can ultimately modify their behavior (Choi & Lee, 2017). Future research should compare user-created and corporate-created communities, and it should also examine how product recommendation behavior is influenced.

It is crucial to recognize that the emotional trigger, which is a complicated process that can be influenced by a number of things, must be founded on communication and interaction amongst community members. Future studies should examine additional elements including motivation, trust, and perceived justice that may affect behavior in online groups. Future investigations could also examine the effects of various incentives, such as rewards and recognition.

Declarations

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