More gain, more give? The impact of brand community value on users' value co-creation

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ABSTRACT

Users' value co-creation behaviors contribute to the prosperity of brand communities as well as brand performance. This article aims to answer a basic question: are brand community users who obtain more value from the brand community more willing to co-create value? If so, why and under what conditions? Drawing from reciprocity theory, this study proposes that information value and social value lead to value co-creation by evoking users' reciprocity norm, and this effect depends on their self-presentation in the community. Results based on structural equation modeling combining survey data and archival data largely validate this framework, revealing that the reciprocity norm mediates the influence of brand community value on value co-creation. Additionally, information value increases value co-creation only when the level of self-presentation is high, and the positive effect of social value is not altered by self-presentation. By uncovering the mechanism and boundary conditions of how brand community value affects users' value co-creation behaviors, this study extends the current literature on value co-creation and provides important practical implications.

1. Introduction

Users' value co-creation behaviors have been considered an important factor in the prosperity of brand communities (Bu et al., 2020; Cheung and M To, 2021; Gambetti and Graffigna, 2015; Skålén et al., 2015; Zhu et al., 2022). Typically, value co-creation in brand communities includes a series of behaviors such as helping peer users in problem-solving, participating in new product development, submitting suggestions on community events and brands, and so on (Cao et al., 2022; Tajvidi et al., 2020; Zhao et al., 2018). Since value co-creation practices allow users to help each other and exchange information, they greatly improve the relationship between users and enhance the cohesiveness of brand communities (Carlson et al., 2008; Cui et al., 2022; Luo et al., 2016; Zaglia, 2013). Users' value co-creation behaviors are also beneficial for the brand's product innovation and strategy formulation by providing useful suggestions (Elia, Messeni Petruzzelli, and Urbinati 2020; Payne et al., 2009). By improving user-user and user-brand relationships, value co-creation helps establish a harmonious community environment which is critical to the development of brand communities (Luo et al., 2016; Luo et al., 2015; Pan, 2020).

With the increasing scholarly attention that value co-creation receives, scholars have explored various factors influencing users' value co-creation in different contexts (Foroudi et al., 2019; Skourtis et al., 2019; Zhao et al., 2018), such as community characteristics (Chen et al., 2021), social capital (Cao et al., 2022), and social ties (Opata et al., 2019). Meanwhile, it is well established that the value users derive from brand communities affects their behaviors significantly, such as motivating their community engagement and facilitating purchase intention (Li et al., 2021; Wang et al., 2019). However, there is still a basic question to be addressed: are brand community users who obtain more value from the brand community more willing to participate in value co-creation? Brand community value consists of social value, which provides users with a sense of identification and belongingness, and information value, which offers users informational and functional benefits (Chen and Lin, 2019; Jiao et al., 2018). Despite the fact that users derive information and social value from brand communities, they should not be simply assumed to be value co-creators. Research has demonstrated that a large number of users are lurkers who only browse content but do not contribute to the brand community (McLaughlin et al., 2022; Mousavi et al., 2017). Thus, another question concerns under what conditions users who obtain value from the brand community are more likely to participate in value co-creation.

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To address the above research questions, this study examines the impacts of information value and social value on users' value co-creation behaviors. Drawing from the theory of reciprocity, we propose that the reciprocity norm is an important underlying mechanism for how brand community value facilitates value co-creation (Gouldner, 1960). According to this theory, we further propose that self-presentation is an important contingent factor influencing users' value co-creation behaviors because users with a high level of self-presentation may be more susceptible to the norm of reciprocity after deriving value from brand communities. Data were collected from 418 users of the Xiaomi community, which is a brand community of a well-known digital brand, to test the proposed framework (Meng et al., 2019; Shen et al., 2018). Structural equation modeling was employed to analyze the data and test the hypotheses. The results show that both information value and social value have a positive effect on value co-creation. Moreover, brand community value facilitates value co-creation through the mediation of the reciprocity norm. The influence of information value on the reciprocity norm is stronger when users' self-presentation is high, although self-presentation does not moderate the effect of social value.

This study contributes to the literature on value co-creation in several ways. First, it highlights the importance of brand community value in shaping users' value co-creation behaviors in virtual brand communities. By confirming that brand community value is a critical antecedent of users' value co-creation intention, this study addresses the question of whether users who obtain more value are more willing to participate in value co-creation (Chen et al., 2021; Zhao et al., 2018). Second, this study adds to the literature by uncovering the underlying mechanism of how brand community value affects value co-creation through the reciprocity norm. Moreover, this study sheds light on the research of the reciprocity norm in online communities by affirming community value as a newly discovered driver (Liao et al., 2020; Pai and Tsai, 2016). Finally, this study contributes to the value co-creation literature by examing the moderating effect of self-presentation. Our findings demonstrate that self-presentation enhances the norm of reciprocity, which in turn leads to higher co-creation. Therefore, this study provides a new perspective for future research on user behaviors in online communities. More broadly, this paper provides important implications for facilitating users' value co-creation behaviors in brand communities.

2. Literature review

2.1. Value co-creation within virtual brand communities

A brand community is essentially "a specialized and non-geographically bound community that is based on a structured set of social relationships among admirers of a brand" (Muniz and O'Guinn, 2001 p.412). The fast popularization of the internet has enabled firms to build brand communities online, which then are called virtual brand communities (Liao et al., 2020; Zheng et al., 2022). Consumers nowadays can easily participate in virtual brand communities, where they can interact socially with other users, share information and ideas, respond to queries, and contribute to the improvement of the brand's products (Bilro and Sandra Maria, 2021; Kumar and Kumar 2020; Liao et al., 2020; Santos et al., 2022). In addition, consumers' participation in brand communities enhances their identification with the community and relationship with the brand (Kaur et al., 2020; Kim et al., 2022; Santos et al., 2022), thereby bringing various benefits for the brand, including brand trust (So et al., 2016), brand commitment (Wirtz et al. 2013), brand loyalty (Dessart et al., 2019), and firm performance (Pansari and Kumar 2017). Thus, brand community participation significantly enhances consumer-brand relationships and generates important long-term benefits for both consumers and brands (Hsieh et al., 2022; Kaur et al., 2020; Santos et al., 2022).

Value co-creation is defined as the interactive process whereby

multiple actors cooperate to generate new value through their voluntary contribution (Kao et al., 2016; Opata et al., 2019; Saha et al., 2021; Vargo and Lusch, 2016). In traditional value creation theory, firms were considered to be the only value creator, while consumers derived value passively (C. K. Prahalad and Ramaswamy, 2004; Zhao et al., 2018). However, with the proliferation of the internet, consumers nowadays can obtain information and create content conveniently, enabling them to actively co-create value with other consumers and firms (Pandey and Kumar 2021; Saha et al., 2020; Zhao et al., 2018). Rodríguez-López (2021) classifies value co-creation behaviors in brand communities and indicates that the value co-creation process is driven mainly by users' practices in exchanging information, establishing community norms, and recommending products and services. In the focal brand community of this study, users create value for the brand and its community mainly by exchanging information, solving other users' problems, and expressing opinions on product design, production, improvement, and usage (Chen et al., 2021; Liao et al., 2019; Song and Qu, 2022). Generally, in the focal brand community, users co-create value through interactions with other users and the brand, focusing on the topic of digital products (Guzmán et al., 2019). Value co-creation has been found to help firms recognize consumers' needs, receive voluntary feedback, reduce the risks involved in the product development process, and strengthen consumer-brand relationships (Cao et al., 2022; Nadeem et al., 2021; Wang et al., 2020). In addition, value co-creation provides utilitarian and emotional benefits for consumers by improving their consumption experiences, providing them with customized products and services, and offering them a sense of fulfillment and achievement (Agrawal and Rahman, 2015; Nadeem et al., 2021; Smedlund et al., 2018).

Many scholars have explored the antecedents of users' value co-creation behaviors in brand communities (Cao et al., 2022; Chen et al., 2021; Song and Qu, 2022; Zadeh et al., 2019). Users' attitudes toward value co-creation and their perceived control over value co-creation psychologically motivate their value co-creation behaviors on social media platforms (Zadeh et al., 2019). The social capital of brand communities motivates users to co-create value for the community, as it facilitates interactions among users and enhances their cohesion (Cao et al., 2022; Xie et al., 2021). The harmonious environment of brand communities and users' subject factors like self-efficacy and outcome expectation are important antecedents of users' willingness to participate in value co-creation (Zhao et al., 2018). Users' perceived value also significantly affects their value co-creation behaviors, for it motivates their community engagement and mediates the influence of psychological drivers such as self-efficacy on value co-creation intention (Song et al., 2020; Wang et al., 2019; Zhao et al., 2018).

2.2. Reciprocity norm

Reciprocity norm refers to the principle that requires people to return a favor to those who have helped them (Burger et al., 1997; Gouldner, 1960). According to Gouldner (1960), the norm of reciprocity is universally applicable to all cultures, exists in every interpersonal relationship, and eventually stabilizes the social system. Given its importance, the reciprocity norm has been a key concept in many disciplines, such as economics, political science, consumer research, and sociology since its introduction (Gervasi et al., 2022; Li et al., 2013; Perugini et al., 2003). According to Deckop et al. (2003), the reciprocity norm is among the most important rules of human society, as reciprocity is a fundamental part of social life. Many studies have utilized different experiments to investigate the reciprocity norm in the business context (Shulga et al., 2021; Swoboda and Winters, 2021; Yang, 2018). Gervasi et al. (2022) conducted a systematic review of the reciprocity literature in the organizational behavior field and provide a comprehensive classification of the concept and features of reciprocity.

In brand communities, the reciprocity norm is an important principle

governing the interactions and participation of users, as users fundamentally rely on their reciprocal relationships with other users and the brand (Putnam, 2000; Wellman et al., 1997). Moreover, driven by the norm of reciprocity, users may help not only the person offering the favor but a third person as well (Chan and Li, 2010; Liao et al., 2020). Users' reciprocal behaviors show the goodwill and cooperation of the community, thereby enhancing users' identification with the community and facilitating their sense of belongingness (Pai and Tsai, 2016; Wong, 2023). The reciprocity norm is one of the key motivations that drive users to participate in value co-creation (Carvalho and Alves, 2022; Lan et al., 2017; Shulga et al., 2021). For example, Carvalho and Alves (2022) systematically reviewed consumers' value co-creation behaviors in the tourism industry, finding that value co-creation is collective action based on social values such as reciprocity and trust. Pai and Tsai (2016) demonstrate that the reciprocity norm is a determinant of consumers' information-sharing behavior in online communities. Reciprocity is also considered an essential element of social capital in brand communities, which then motivates users' value co-creation behaviors by strengthening the collaboration of the community (Cao et al., 2022; Kim and Yoon, 2021; Meek et al., 2019). However, the various antecedents and potential moderators of the reciprocity norm in brand communities require further research investigation (Liao et al., 2020; Pai and Tsai, 2016).

2.3. Self-presentation

A desire for self-presentation also shapes consumers' behaviors significantly, and the proliferation of social media enables consumers to express themselves in this wide arena (Herring and Kapidzic, 2015; Hollenbaugh, 2021; Luo and Hancock, 2020). Online communities offer a platform for users to present their preferred images in their favored group (Jacobsen and Lähteenmäki, 2017). In most online communities, users have personal profile pages where they can customize their basic information, group affiliation, avatars, and signatures (Kear et al., 2014; Schlosser, 2020; Schwämmlein and Wodzicki, 2012). In some virtual brand communities, users' personal pages also display their community engagement and purchase experiences with points, labels, and badges (Hanson et al., 2019; Sicilia and Palazón, 2008). These features fulfill users' desire for self-presentation, allowing them to display their self-image and express themselves (Krämer and Winter 2008; Park and Chung, 2011; Schau and Muniz Jr. 2002).

Self-presentation may have a positive relationship with users' value co-creation intention in virtual brand communities (Bae and Kim, 2023; Hanson et al., 2019; Jacobsen and Lähteenmäki, 2017; Teichmann et al., 2015). By enabling community users to display their self-images and learn about others conveniently, self-presentation makes it easier for users to discover similarities with others and thus become more

identified with the community (Jacobsen and Lähteenmäki, 2017; Liao et al., 2019). A higher level of brand community identification will then enhance users' emotional attachment to the brand, facilitate their brand loyalty, and create a harmonious environment for users to interact with others, which are all positively related to users' value co-creation behaviors (Arnone et al., 2009; Chang et al., 2020; Ha, 2018; Luo et al., 2016). Additionally, the presentation of honors that users have achieved offers a sense of satisfaction and approval, thereby motivating them to co-create value for the brand community (Hanson et al., 2019; Jacobsen and Lähteenmäki, 2017; Teichmann et al., 2015).

3. Research model and hypotheses

The theoretical model is shown in Fig. 1.

3.1. The influences of information value and social value

Transcending geographic barriers, brand communities enable users to exchange information and communicate with the brand and other users without difficulty (Brodie et al., 2013; Coelho et al., 2019; Kim et al., 2019). The motivation for consumers to participate in virtual brand communities is often to obtain information and support (Li et al., 2021; Prentice, 2018). The exchange of information satisfies users' needs and enhances their well-being, resulting in a stronger commitment to the community (Sheth and Parvatlyar, 1995; Zhang, 2020). Wang et al. (2019) find that the information value of brand communities influences their users' community commitment positively by generating satisfaction. Brand community commitment demonstrates users' continuous intention to maintain a relationship with the community and plays an important role in driving users' behavior (Fawcett et al., 2021; Lee and Hsieh, 2022; Santos et al., 2022). In consequence, users' community commitment enhances the collaboration of brand communities and motivates users to contribute to the community by participating in value co-creation (Fawcett et al., 2021; Lee and Hsieh, 2022; Shen et al., 2018; Wang et al., 2019).

In addition, the information value offered by virtual brand communities also provides users with the resources necessary for value co-creation. Information sharing is a critical part of the value co-creation process in virtual brand communities (Chen et al., 2021; Shirazi et al., 2021). To share information with others, users first must accumulate product-related information and knowledge, which they can obtain from their interactions and engagement in brand communities (Dwivedi et al., 2021; Santos et al., 2022; Zhang, 2020). Consequently, information value offered by brand communities facilitates users' value co-creation behaviors. Thus.

H1. Information value of virtual brand communities positively influences value co-creation.
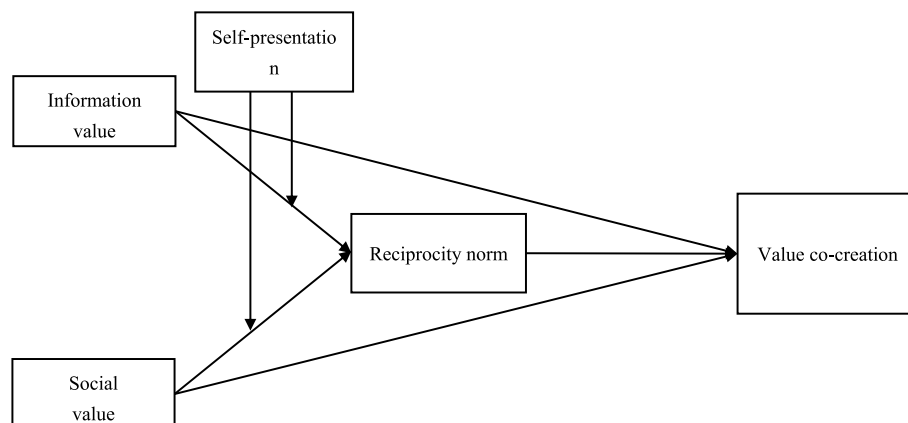

Fig. 1. Research model.

In virtual brand communities, users interact with others to establish social relationships with other users and the brand, inducing a sense of group identity and connectedness (Li et al., 2021; Wang et al., 2021). Participation in brand communities helps users find friends with similar interests, thus enabling them to build a social network and obtain social support (Santos et al., 2022; Wang et al., 2019). In this study, social value refers to the sense of connectedness, belongingness, and identification that users achieve through their social interactions with other users and the brand (Jiao et al., 2018; Li et al., 2021; Wang et al., 2021).

Strong social value can spur positive behaviors such as helping others in brand communities (Han et al., 2007; Wang et al., 2021; Zollo et al., 2020). By satisfying users' need for belonging and desire to establish intimate relationships, social value can cultivate trust among users (Wang et al., 2021; Wang and Li, 2017). Trust is essential for facilitating value co-creation in brand communities, as it reduces users' uncertainty and strengthens the community's cohesiveness (Cao et al., 2022; Casper Ferm and Thaichon 2021; Wang et al., 2021). Wu and Munir Sukoco (2010) argue that users' desire to be connected with other community users is a key motivation for information and knowledge sharing. Moreover, research has shown that the social value of virtual brand community increases users' positive impressions of the brand, leading them to be more willing to provide feedback on the product and contribute to both the brand and the community (Chen et al., 2021; Füller et al., 2008). Hence.

H2. Social value of virtual brand communities positively influences value co-creation.

3.2. The mediating role of the reciprocity norm

In brand communities, the reciprocity norm engenders users feeling obligated to reciprocate the beneficial resources they receive (Pai and Tsai, 2016). Previous studies find that the reciprocity norm emphasizes resource sharing, voluntary collaboration, and cooperation in online communities (Chan and Li, 2010; Chen and Hung, 2010; Sánchez-Franco and Roldán, 2015). Therefore, the reciprocity norm builds on the preconception that users should repay the beneficial treatment they have received, which strengthens their intention to co-create value for the community (Carvalho and Alves, 2022; Pai and Tsai, 2016). For instance, Liao et al. (2020) reveal that the reciprocity norm positively influences users' knowledge contribution behaviors in virtual brand communities. Additionally, the reciprocity norm reduces users' free-riding behaviors, increasing the likelihood that users will reciprocate the community through value co-creation after obtaining value from their interactions (Kathan et al., 2013; Wang et al., 2021). As an essential element of social capital in brand communities, the reciprocity norm promotes the collaboration of brand communities and fosters users' community participation, thus facilitating users' willingness to co-create value (Cao et al., 2022; Kim and Yoon, 2021; Meek et al., 2019). Since reciprocal behaviors reflect the goodwill of community users, focal users' impression of the community may be improved after observing others' reciprocal behaviors (Pai and Tsai, 2016; Wong, 2023). As a result, users become more identified with the brand community and are more likely to engage in value co-creation (Zhang et al., 2021). Thus.

H3. The reciprocity norm positively influences value co-creation.

The information value offered by virtual brand communities satisfies users' need for information and benefits them (Li et al., 2021; Sheth and Parvatlyar, 1995). Such satisfaction may lead to a feeling of indebtedness and evoke users' sense of reciprocity (Feng and Hua, 2016; Peng et al., 2020). The reciprocity norm will then stimulate users to pay back their communities by participating in value co-creation (Pai and Tsai, 2016; Zhang et al., 2021). Additionally, users' positive attitude toward the brand is key to their engagement in value co-creation in brand communities (Lecat et al., 2009; Zadeh et al., 2019). Observing others'

acts of kindness, such as providing information value, leads to a positive attitude and activates users' intention to co-create value for the community (Pai and Tsai, 2016; Wong, 2023). Research has also shown that the perception of reciprocity is an antecedent of intention to contribute knowledge in brand communities, indicating that the reciprocity norm mediates the effect of users' perceived value on their value co-creation (Liao et al., 2020). Hence.

H4. The reciprocity norm mediates the influence of information value on value co-creation.

The social value provided by virtual brand communities benefits community users by satisfying their need for belonging and group identification (Jiao et al., 2018; Li et al., 2021; Wang et al., 2021). The reciprocity norm suggests that users will try to avoid over-benefiting from their social interactions and may feel in debt for the social value they have obtained (Feng and Hua, 2016; Gouldner, 1960; Uehara, 1995). A sense of indebtedness and fairness may motivate users to reciprocate the social value they have derived from community interactions (Gouldner, 1960; Peng et al., 2020; Shumaker and Arlene, 1984). To participate in value co-creation, users must be aware of the mutual interest in brand communities. Since the transformation of users' focus from self-interest to mutual interest is motivated primarily by the reciprocity norm, community users must hold the reciprocity norm before they participate in value co-creation (Atias et al., 2023; Casaló et al., 2008; Hsieh et al., 2022). Thus.

H5. The reciprocity norm mediates the influence of social value on value co-creation.

3.3. The moderating effect of self-presentation

Self-presentation shows a person's desirable self-image to other users, which makes that user's identity visible to the whole brand community and reduces anonymity (Black and Veloutsou, 2017; Schlosser, 2020). A visible identity reduces the likelihood of users' free-riding behaviors because it leaves a bad impression on other users and weakens the focal user's effort to maintain a positive self-image (Hollenbaugh, 2021; Kathan et al., 2013; Wang et al., 2021). Therefore, a high level of self-presentation may enhance users' willingness to contribute to the community after obtaining value from other users. In contrast, users with weak self-presentation may perceive less moral pressure from free-riding behaviors and thereby be less likely to reciprocate the value they have received (Bae and Kim, 2023; Black and Veloutsou, 2017; Morgan-Knapp, 2022; Nielsen et al., 2014).

The display of self-image in brand communities provides users with a sense of sharing and a means to express themselves, which can positively influence their commitment to the community (Park and Chung, 2011). By creating a sense of achievement, users' affective commitment increases their intention of contributing to the brand communities (Meyer et al., 2004; Shen et al., 2018). Users with a strong desire for self-presentation also tend to value their social connections and relationship with others, as they require counterparts to share their self-image and interact with them (Park and Chung, 2011). Self-presentation makes it easy to generate emotion-based trust between individuals and promotes their intimacy (Chiu et al., 2006; Øverup and Neighbors, 2016). Therefore, users with high self-presentation are more likely to follow the norm of reciprocity in their interpersonal relationships (Chen et al., 2021; Chen et al., 2009; Zhao et al., 2018). Thus, we propose the following.

H6. Self-presentation moderates the influence of information value on the reciprocity norm. The effect of information value on the reciprocity norm is stronger for users with a high level of self-presentation.

H7. Self-presentation moderates the influence of social value on the reciprocity norm. The effect of social value on the reciprocity norm is stronger for users with a high level of self-presentation.

4. Methodology

4.1. Measurement

In this study, four latent variables (information value, social value, reciprocity norm, and value co-creation) were measured using items adapted from previous literature. Specifically, the measure of information value was obtained from Zhang et al. (2017) and Jiao et al. (2018). The measurement items of social value were adapted from Jiao et al. (2018). The measure of the reciprocity norm was obtained from Wiertz and Ko de Ruyter (2007), and that for value co-creation was adapted from Zhao et al. (2018). All the measurement items are shown in Table 1. A seven-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree) was used based on its general accuracy and validity (Taherdoost, 2019). To address potential common method bias when measuring all variables through a consumer survey, we used information disclosure from participants' user pages to measure self-presentation. The combination of subjective data and objective data can reduce common method bias and enhance the reliability of results. In addition, demographic information about the participants, including gender, age, education, average daily time spent online, monthly income, and length of time spent in virtual communities was collected. This demographic data was used to ensure that participants had certain community experiences and to confirm the authenticity of our sample data.

The survey was conducted in the Xiaomi community, a firm-managed virtual brand community with a reputation for the value co-creation practices of its users (Rodríguez-López, 2021; Shen et al., 2018). We sent an email to community users inviting them to answer web-based questionnaires on the data-collection platform Credamo. The platform's professional services were used to guarantee a random distribution. The survey period lasted for more than 3 months, and a total of 586 completed questionnaires were collected. To match each questionnaire with the actual participation behavior of the user, participants were asked to add their user name in the community to the questionnaire. Among them, 418 participants (71.3%) provided their identifiable user names, and this group constituted the final sample. As is typical for brand communities, this one encouraged users to put personal information on their profile pages and provided space for six items of personal identity-relevant information: user name, avatar, residence, gender, cell phone authentication, and hobbies (see Fig. 2). For example, the user in Fig. 2 presented only an avatar and user name; thus the score of his/her self-presentation is 2 in this study. The demographic data are shown in Table 2.

In terms of gender distribution, males accounted for the vast majority, which is in line with previous studies suggesting that males dominate online brand communities of electronic products such as mobile phones (Jang et al., 2008). Regarding age, more than 80% of participants were 30 years old or younger, most likely reflecting the young age of most users in the community. Education level was largely distributed among those with a bachelor degree or undergraduate (70%). Income distribution was mostly concentrated among those earning less than 6000 RMB, most likely due to the youth of many participants, including students who have not yet joined the workforce. The average daily time spent online was distributed primarily among those spending more than 2 h online daily. Finally, the length of community membership was more or less evenly distributed.

4.2. Reliability

We incorporated reliability tests of internal consistency and combined reliability. The internal consistency of the scale was evaluated using Cronbach's alpha coefficient, which is the most commonly used reliability measure. Cronbach's alpha coefficient is used to assess the internal consistency of scale indexes–i.e., to test the degree of correlation between a measured question item and the remaining question items of the same variable–with a larger alpha value indicating higher reliability. A questionnaire's reliability can be considered acceptable if the alpha value is greater than 0.6. In this study, we set 0.7 as the boundary value for acceptance.

Cronbach's alpha and combined reliability analyses were conducted on the sample data using SPSS 22.0, and the results are presented in Table 1. Cronbach's α values of all latent variables were greater than 0.7, indicating high internal consistency for each latent variable. None of the combined reliability values were below 0.9, indicating high combined reliability for all latent variables. The overall Cronbach's alpha value of the questionnaire was 0.946, which is greater than 0.9, indicating very high reliability.

The goodness-of-fit indicators of the measurement model were as follows: $\chi2 = 116.886$, $\chi2/df = 2.54$, RMSEA = 0.067, GFI = 0.952, CFI = 0.982, NFI = 0.970, IFI = 0.984, indicating that all fits of the measurement model were acceptable (Schermelleh-Engel et al., 2003). Specifically, the $\chi2/df$ was smaller than the recommended value of 3.0, and the comparative fit index (CFI), the normed fit index (NFI), and the goodness-of-fit index (GFI) were all larger than 0.90. Furthermore, the convergent validity of the model was good, with all factor loadings exceeding 0.70. Additionally, the root means square residual (RMSR) was smaller than 0.05 and the root means square error of approximation (RMSEA) was 0.08, indicating that the hypothesized CFA model fitted well with our empirical data.

We calculated the Kaiser–Meyer–Olkin (KMO) to measure sampling adequacy (Hutcheson and Sofroniou, 1999). The KMO is 0.912 (>0.9), therefore, the data are suitable for factor analysis. As Table 3 shows, the

Table 1
Measurements.

Variable	Number	Items	Factor loading	Cronbach's α
Information value	IV1	I find useful information in the brand community.	0.925	0.911
	IV2	I get value by learning about new things in the brand community.	0.948	
	IV3	I get practical information about products and services in the brand community.	0.892	
Social value	SV1	I get my value by socializing with my friends in the brand community.	0.896	0.923
	SV2	I get my value by finding out what other people are doing in the brand community.	0.864	
	SV3	I get my value by sharing photos, music, or videos in the brand community.	0.842	
	SV4	I get my value by telling people what I am doing in the brand community.	0.846	
Reciprocity norm	REC1	When community users ask for help, I should help them.	0.914	0.844
	REC2	When I am helped by other users, I feel that I should help them when they need.	0.922	
Value co-creation	VC1	I will participate in value co-creation activities of the brand community.	0.932	0.912
	VC2	I will learn more to better participate in value co-creation in the brand community.	0.919	
	VC3	I want to provide my feedback on the brand's products and services.	0.831	

Fig. 2. An example of a user's profile page.

Table 2
Demographic characteristics.

Demographic characteristics		Number of people	Proportion
Gender	Male	328	78.47%
	Female	90	21.53%
Age	Over 30 years old	81	19.38%
	26–30	85	20.33%
	18–25	211	50.48%
	Under 18 years old	41	9.81%
Education level	Master and above	32	7.66%
	Bachelor and undergraduate	289	69.14%
	High school and below	97	23.21%
Monthly income level	More than 6000 RMB	88	21.05%
	4001-6000 RMB	97	23.21%
	2001-4000 RMB	73	17.46%
	Under 2000 RMB	160	38.28%
Average daily time spent online	More than 6 h	106	25.36%
	Between 4 and 6 h	105	25.12%
	Between 2 and 4 h	146	34.93%
	Less than 2 h	61	14.59%
Length of community membership	More than 2 years	159	38.04%
	1 year - 2 years	115	27.51%
	Less than 1 year	144	34.45%

average variance extracted (AVE) values of each latent variable were found to be greater than the square of the correlation coefficients between other variables, indicating good discriminant reliability. Additionally, the composite reliability (CR) of each latent variable was greater than 0.7, signifying a good level of reliability. These results indicate that the measurement model in this study has good discriminant validity and reliability. Additionally, Harman's single factor test was used to examine common method variance. The result indicated that a single constrained factor accounted for only 33% of the variance, less than the 50% threshold, suggesting that the common method variance is not a problem.

4.3. Hypotheses testing

Structural equation modeling (see Table 4) revealed that the path coefficient of "information value → value co-creation" was 0.203, $p < 0.005$, indicating that H1 was supported. The path coefficient of "social value → value co-creation" was 0.521, $p < 0.001$, validating H2. The path coefficient of "reciprocity norm → value co-creation" was 0.165, $p < 0.005$, supporting H3. Additionally, social value had a greater impact on value co-creation than information value.

We used the bootstrap method to test mediation (Zhao et al., 2010). The sample size was chosen to be 5000, and the mediating effect would be considered significant if the indirect effect included 0 at the 95% confidence interval. The analysis results are presented in Table 4. It can be seen that the indirect effect of the mediating variable was not 0 and the 95% confidence interval did not include 0, indicating that the mediating effect of "self-presentation" was significant.

In terms of the effect of the reciprocity norm on the "information value → value co-creation" path, the lower limit of the mediating effect was 0.0641 and the upper limit was 0.2278, with the interval not including 0, indicating a significant mediating effect. Therefore, the mediating effect of reciprocity norm on "information value → value co-creation" was established, in support of H4.

Regarding the influence of the reciprocity norm on the "social value → value co-creation" path, the lower limit of the mediating effect was 0.0449 and the upper limit was 0.2151, with the interval not including 0, indicating a significant mediating effect. Thus, the mediating effect of reciprocity norm on "social value → value co-creation" was established, in support of H5.

We utilized AMOS 22.0 using multiple group regression analysis to examine the moderating effect (Kim and Baek, 2017). The sample data was divided into two groups: "strong self-presentation," which included scores of self-presentation greater than or equal to 3, and "weak self-presentation," which included scores of self-presentation less than 3. To test the moderating effect, the regression coefficients of the two groups' structural equations were first restricted to be equal, followed by obtaining a $\chi 2$ value. This restriction was then removed and the model was re-estimated to obtain another $\chi 2$ value. The first $\chi 2$ was subtracted

Table 3
Correlation of latent constructs and descriptive statistics.

Variables	Information value	Social value	Reciprocity norm	Value co-creation	Self-presentation
Information Value	1				
Social Value	0.506***	1			
Reciprocity Norm	0.471***	0.488***	1		
Value co-creation	0.445***	0.390***	0.252***	1	
Self-presentation	0.312***	0.406***	0.437***	0.313***	1
Mean	5.27	5.39	6.04	5.78	3.14
Standard deviation	1.25	1.22	0.997	1.16	1.50
CR	0.944	0.920	0.914	0.923	–
AVE	0.850	0.743	0.842	0.801	–

Note: * denotes $p < 0.05$,** denotes $p < 0.01$,*** denotes $p < 0.001$.

Table 4
Testing the mediating role of the reciprocity norm.

Independent variable	Intermediary Effect			Main effect			Intermediaries Type
	Lower limit	Upper limit	Significance	Lower limit	Upper limit	Significance	
Information value	0.0641	0.2278	Significant	0.3865	0.5517	Significant	Partial mediation
Social value	0.0449	0.2151	Significant	0.4438	0.6182	Significant	Partial mediation

from the second $\chi 2$ to obtain a new $\chi 2$ for the moderating effect. A significant $\chi 2$ test would indicate a significant moderating effect. The results of the analysis are reported in Table 5.

A moderating effect is considered significant when the difference of χ^2 with 1 degree of freedom (df) is greater than 3.84 (Shanahan et al., 2012). Table 5 shows that the $\Delta\chi 2$ value for the path "information value → reciprocity norm" is 12.497, p < 0.001, indicating that the moderating effect of self-presentation on the influence of information value on reciprocity norm was significant, with the path coefficient of the group with strong self-presentation being positive and significant, but the path coefficient of the group with weak self-presentation not achieving significance. The moderation effect is depicted in Fig. 3. For the path "social value→reciprocity norm," the $\Delta\chi 2$ was 0.103 (p > 0.05), suggesting that there was no significant difference between the two groups. These findings support H6 but do not support H7.

5. Discussion

Users' value co-creation behaviors are critical to the development of virtual brand communities (Cao et al., 2022; Chen et al., 2021; Zhao et al., 2018). This study aims to understand how brand community value influences users' value co-creation behaviors, using the lens of the reciprocity norm. Through empirical analysis, the following findings were obtained.

First, information value and social value both facilitate users' value co-creation behaviors, with social value having a larger impact on value co-creation. Our findings help develop a deeper understanding of users' value co-creation behaviors in brand communities. By demonstrating the stronger positive impact of social value, our results indicate that the sense of connectedness, belongingness, and identification that users achieve through their social interactions may have a closer relationship to users' value co-creation intention than the informational and functional benefits they derived. Second, the reciprocity norm fosters value co-creation and mediates the influences of information value and social value on value co-creation. This result uncovers the internal mechanism of how community value affects value co-creation in brand communities and illustrates the crucial role of the reciprocity norm in the formation of users' value co-creation intention (Carvalho and Alves, 2022; Lan et al., 2017; Shulga et al., 2021). Third, self-presentation moderates the influence of information value on the reciprocity norm but it does not moderate the impact of social value. The possible reason will be discussed in the following part. This finding sheds light on how users' characteristics shape their value co-creation behaviors.
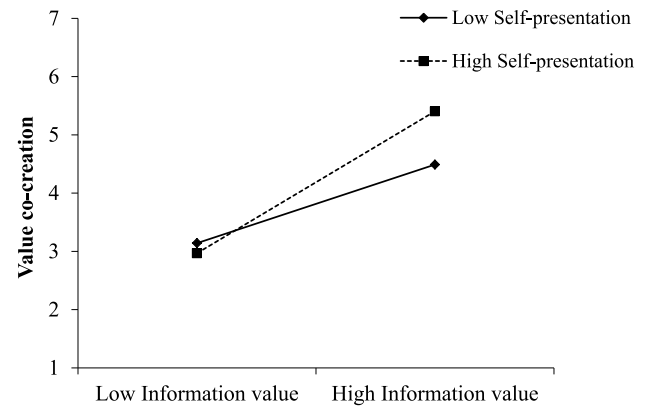

Fig. 3. The moderation effect of self-presentation.

5.1. Theoretical contributions

This study offers several theoretical contributions. First, it extends the literature on value co-creation in virtual brand communities by confirming that brand community value is a strong antecedent of users' value co-creation behaviors. Although brand community value has a significant influence on users' behaviors, it was previously unknown whether users who obtain more value are more willing to participate in value co-creation. Previous studies have examined drivers of value co-creation behaviors such as consumer participation (Mursid, 2021), social capital (Cao et al., 2022; Xie et al., 2021), brand loyalty (Zhao et al., 2018), and attitude toward value co-creation (Lee et al., 2019; Zadeh et al., 2019). In addition, perceived value was considered to act mainly as a mediator between other variables and users' value co-creation intention (Chen et al., 2021; Zhao et al., 2018). By demonstrating that users are motivated to participate in value co-creation by the value they have obtained from the community, this study illustrates the important role of brand community value in value co-creation and extends value co-creation literature.

Second, this study reveals the underlying mechanism of how brand community value facilitates value co-creation behaviors by confirming the mediating role of the reciprocity norm. Previous research has called for studies to uncover the internal mechanism of the formation of value co-creation behaviors in brand communities (Pan, 2020; Priharsari et al., 2020; Rodríguez-López, 2021; Za et al., 2020), and mediators such as member inspiration (Cao et al., 2022), perceived benefit (Chen et al., 2021), consumer satisfaction (Frasquet-Deltoro et al., 2018), and social interactions (Opata et al., 2019) have been investigated. By applying reciprocity theory to value co-creation research and verifying the mediating role of the reciprocity norm, this study furthers our understanding of value co-creation in the context of virtual brand communities (Carvalho and Alves, 2022; Shulga et al., 2021). In addition, Pai and Tsai (2016) suggest that more empirical studies should be made to explore antecedents of the reciprocity norm in brand communities. Responding to this appeal, this study finds community value to be a driver of the reciprocity norm, which complements the prior brand community literature (Liao et al., 2020).

Table 5
Testing the moderating role of self-presentation.

Path	$\Delta\chi^2$	Path coefficient	
		Strong self-presentation	Weak self-presentation
Information value → Reciprocity norm	12.497***	0.284**	0.117
Social value → Reciprocity norm	0.103	0.578***	0.539***

Note: * denotes p < 0.05,** denotes p < 0.01,*** denotes p < 0.001.

Finally, this study provides insights into how users' characteristics shape their value co-creation behaviors in brand communities by examing the moderating effect of self-presentation. Existing research has examined the influence of self-presentation desire on consumers' purchase intention, such as their intention to buy digital products (Chen and Chen, 2022; Kim and Kankanhalli, 2012). In the context of online communities, scholars have revealed the impact of self-presentation on consumers' citizenship behaviors (Wang et al., 2021) and community commitment (Park and Chung, 2011). This study adds to extant studies by demonstrating the effect of self-presentation on the formation of the reciprocity norm. Additionally, our findings highlight the boundary condition for the effect of information value. Only users with a high level of self-presentation will reciprocate the information value they have derived by participating in value co-creation. As for social value, self-presentation does not moderate its effect. The possible reason may be that the moral pressure attending free-riding behaviors is offset by the impact of social value, leading users with a low level of self-presentation to feel less motivated to co-create value for the community after obtaining value from social interactions (Bae and Kim, 2023; Black and Veloutsou, 2017; Morgan-Knapp, 2022; Nielsen et al., 2014). Finally, our findings demonstrate that users' characteristics shape their value co-creation behaviors, which suggests that users' characteristics may also affect their behaviors in other aspects, such as electronic word-of-mouth intention. Therefore, this study offers a new perspective for future research on user behaviors in online communities (Qiao et al., 2021).

5.2. Managerial implications

This paper provides the following practical implications. First, managers should optimize users' experience of acquiring information and satisfy their need for information in virtual brand communities. A brand community can serve as an information center for its users and visitors, thus satisfying users' need for information and providing them with community value (Li et al., 2021; Wang et al., 2019). Establishing a harmonious atmosphere and fostering a culture of collaboration among community users can be a good way to facilitate information sharing in brand communities (Zhao, 2019; Zhao et al., 2018; Zhou et al., 2013). Improving information quality and encouraging interactions between users can also increase community users' perception of information value (Luo et al., 2016; Wang et al., 2019). Additionally, reward systems can be used to further motivate users to exchange information (Jung et al., 2014; Meng et al., 2019). For instance, in the Xiaomi community, users obtain credits as rewards according to the popularity of their posts. Ultimately, users' value co-creation behaviors have benefitted Xiaomi in different aspects, such as improvement of innovation performance (Meng et al., 2019).

Second, managers of brand communities should invest effort to strengthen users' perception of social value. Considering the nature of brand communities as social platforms, it is important for companies to enhance social interactions among community users (Algesheimer et al., 2005; Jiao et al., 2018; Li et al., 2021). Encouraging users to share their interests, hobbies, and brand experiences in the community is a good way to help increase communication interactivity. Furthermore, platforms should be improved to inform users regularly about how others respond to their content (Wang et al., 2021). Promoting opinion leaders with high sociability has also been shown to be beneficial for social interactions in virtual brand communities, for they strengthen the cohesiveness and users' identification of the community (Demiray and Burnaz, 2019; Jiao et al., 2018). A brand should also demonstrate its good intention and ability in its brand community frequently to facilitate its interactions with community users because users' interactions with brands are considered a significant source of perceived social value in communities (Jiang et al., 2021).

Third, brands should promote a healthy atmosphere of reciprocity and mutual assistance in brand communities. As a key principle governing users' interactions and participation, the reciprocity norm also plays a critical role in the formation of users' value co-creation intention (Liao et al., 2020; Putnam, 2000; Wellman et al., 1997). Therefore, brands should publicly recognize users who contribute to the community through various methods, such as designing a badge system or giving honorary titles (Liao et al., 2020; Meng et al., 2019). Additionally, setting up a specific help-seeking section in the community may facilitate users' asking for and providing assistance, which can significantly improve the climate of reciprocity (Liao et al., 2022). Furthermore, community managers should maintain efficient and transparent communication channels to create an atmosphere of reciprocity and a harmonious environment in brand communities (Wong and Lee, 2022).

Fourth, brands should encourage and motivate community users to showcase themselves. Although marketers have realized the importance of self-presentation in brand communities and promoted it in various ways, its influence on value co-creation behaviors heretofore has been overlooked (Boyd and Ellison, 2007; Herring and Kapidzic, 2015). Our results indicate that self-presentation is important for the formation of value co-creation behaviors. Community managers should encourage users to customize their personal web pages to present their profile information, interests, and honorary titles they have received, which fosters value co-creation behaviors and eventually benefits the brand in many ways (Hanson et al., 2019; Jensen Schau and Gilly, 2003; Park and Chung, 2011). Furthermore, by assessing a user's level of self-presentation, a brand can predict that individual's willingness to participate in value co-creation in the community.

5.3. Limitations and future research directions

This research has some limitations that call for further studies. First, the survey was conducted in a virtual brand community of electronic products, which may have its particularity. For example, a large proportion of users in electronic product brand communities are male (Jang et al., 2008). Therefore, our sample may lack representativeness, and scholars should conduct research in other types of virtual brand communities to verify the generalizability of our findings. Second, although a combination of subjective and objective data was used to reduce common method bias, the use of questionnaire data may still produce methodology bias due to its self-reported nature (Liao et al., 2020). To reduce such bias, future studies should collect longitudinal data on community users' value co-creation behaviors. Third, this study focused on the mediating role of the reciprocity norm in the relationship between brand community value and value co-creation. It is worth investigating other potential mediators such as perceived community support (Ye et al., 2015) and consumer satisfaction (Zhang et al., 2019). By exploring other possible mediating variables, future research may contribute further to understanding how value co-creation is formed in brand communities.

6. Conclusion

This study addresses the basic question of whether users who obtain more value are more willing to participate in value co-creation, by providing evidence that brand community value is a strong antecedent of value co-creation behaviors. Our findings also demonstrate the critical role of the reciprocity norm in the formation of value co-creation intention. This study also reveals the effect of self-presentation on value co-creation behaviors, which indicates that users' characteristics may shape their behaviors in other parts of the community. By complementing prior research and offering a new perspective on users' behaviors in online communities, this study contributes to the value co-creation literature. Our findings also provide important implications for brands on facilitating consumers' value co-creation behaviors.

Research involving human participants and/or animals

The studies involving human participants were reviewed and approved by the ethics committee. All participants gave their written informed consent before the survey.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Declaration of competing interest

The author has no conflict of interest regarding this manuscript.

Data availability

The data that has been used is confidential.

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