EXPLORING THE RELATIONSHIP BETWEEN SILENT BEHAVIOR OF ONLINE COMMUNITY MEMBERS AND PERFORMANCE: A TRUST PERCEPTION PERSPECTIVE

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ABSTRACT

The pervasive phenomenon of silence significantly impacts the operation and development of online communities; however, there is limited research on the positive and negative effects of the silent behavior of online community members. Drawing on social exchange theory, this study examines the influencing factors and consequences of two types of silent behavior of online community members: anti-community silent behavior and pro-community silent behavior, from the perspective of perceived trust in online communities. We further analyze the moderating role of online anonymity. Based on empirical research results from 538 valid questionnaires, we find that the silent behavior of online community members has a double-edged sword effect on performance, with perceived trust identified as a key factor influencing silent behavior. Additionally, it was further discovered that pro-community silent behavior mediates the impact of perceived trust on online community member performance, and online anonymity negatively moderates the influence of perceived interpersonal trust on anti-community silent behavior. This study extends the theoretical application of social exchange theory in the field of online silent behavior and provides constructive suggestions for the practical operation of online communities.

Keywords: social exchange theory; silent behavior; perceived trust; online community member performance

1. Introduction

In the digital age, the online virtual space shaped by the Internet and information technology is transforming the way people connect, communicate, and interact, breaking the constraints of time and space. This evolution has

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gradually segmented social circles into various online communities distributed across virtual space (Armstrong and Hagel, 2009). Online communities, also known as virtual communities, are interpersonal networks formed by individuals engaging in communication and interaction for shared goals, and they have increasingly become a primary channel for social interaction in contemporary society (Hsieh et al., 2024; Luo et al., 2023). The fundamental purpose of operating online communities is to generate valuable information through member interactions (Masson & Parmentier, 2023). Unlike traditional face-to-face interactions, communication among online community members is characterized by virtuality, equality, autonomy, openness, interactivity, and security, effectively mitigating some dysfunctional social psychological impacts associated with in-person interactions (Ho et al., 2008). Existing research indicates that online interaction positively influences interpersonal engagement (Pan et al., 2023). Nonetheless, a pervasive phenomenon of silence exists in online communities, where 90% of participants observe without participating, 9% edit content and contribute sparingly, and only 1% actively create new content. This distribution is referred to as the "90-9-1" principle (Arthur, 2006; Mierlo, 2014; Sun et al., 2014). The widespread silent behavior of online community members (SBOCM) significantly impacts online community development (Hong et al., 2022).

Current research has increasingly focused on the characteristics, expression, and interaction of online community members, extending into theoretical and practical realms such as sociology and organizational management (Santos et al., 2022). However, we observe that researchers tend to concentrate more on observable behaviors such as interaction, sharing, and participation, while there is insufficient attention to online silence behavior (Lai and Chen, 2014; Wang et al., 2022; Xie and Zhang, 2022). Although the obvious behaviors of online community members are crucial for community development, they represent the actions of a minority, while the silent behavior of the majority also deserves attention and further investigation (Mousavi et al., 2017; Chen et al., 2019). Furthermore, existing literature primarily emphasizes the negative effects of silent behavior, with limited exploration of its positive impacts; empirical studies that simultaneously incorporate both positive and negative effects into research models are particularly scarce (Sun et al., 2014; Pei et al., 2022; Nguyen, 2021). Therefore, to bridge this gap, we define the concept and components of SBOCM and examine its positive and negative effects on online community performance, which is a critical outcome of online community operations.

Additionally, to better understand the formation process of SBOCM, we introduce social exchange theory, which views interpersonal interactions as an exchange process based on individual needs and interests (Blau, 1964). SBOCM is regarded as a result of resource exchange, where the exchanged items are positive rather than negative feedback. Specifically, if online community members predict that they will receive positive feedback during interactions, they will reduce silent behavior motivated by egoistic that is detrimental to the online community, termed anti-community silent behavior (ACSB), and increase silent behavior motivated by altruism that benefits the online community, referred to as pro-community silent behavior (PCSB). For instance, In the Xiaomi community, an official forum dedicated to discussions about Xiaomi products and services, a Xiaomi fan with the username "Sanxiannao" commented on the axle break incident of the Xiaomi SU7, which garnered 68 views but only 2 comments. Through this data, Sanxiannao could indirectly perceive the silent behavior of other members. If those two comments were malicious attacks on Sanxiannao rather than discussions about the SU7 axle break incident, Sanxiannao would perceive an increase in ACSB and a decrease in PCSB. To avoid being blindly attacked by other Xiaomi fans, Sanxiannao refrained from making further related comments, which reflects ACSB. Conversely, if he believes that his comments could exacerbate the negative implications for the Xiaomi SU7 and decides to refrain from further comments to maintain harmony within the Xiaomi community, this exemplifies PCSB. Thus, ACSB, reducing the diversity of information flow within the community, has a negative impact on community development. In contrast, PCSB, contributing to the harmonious development of the community, is considered a positive form of silence (Pei et al., 2022).

According to social exchange theory, trust is a prerequisite for exchanges among community members and is a focal point for many scholars studying online communities (Sharma and Klein, 2020; Schilke et al., 2021). In online communities, interpersonal relationships often form spontaneously (Kaur et al., 2020), and trust is a key factor that facilitates voluntary online interactions among community members (Ridings et al., 2002; Xie and Zhang, 2022). Based on social exchange theory, when online community members perceive trust, they are more likely to believe that others will not engage in harmful behaviors toward them (Huang et al., 2023), thereby fostering a willingness to engage in positive social exchanges. Similar to traditional organizations, in online communities, trust encompasses both interpersonal trust and climate of trust (Ilyas et al., 2020). Consequently, we explore the impact of perceived trust on SBOCM from two dimensions: perceived interpersonal trust and perceived climate of trust.

Furthermore, considering the characteristics of anonymity in online communities, which is based on a "human–computer–human" interaction model (Walther, 1996), online community members can engage in anonymous communication by constructing virtual identities (Smirnova et al., 2022), or they can participate in online communities under their real names. Compared to traditional organizations, online community members possess greater autonomy

(Jung, 2011) and face more uncertainty (Christopherson, 2007; Wang, 2023) when engaging in interactions within online communities. To further investigate the impact of online anonymity, we examine it as a boundary condition that influences the relationship between perceived trust and SBOCM.

In summary, we aim to address the following research questions: (1) What are the characteristics and components of SBOCM? (2) Does SBOCM have a double-edged sword effect on online community performance? (3) How does perceived trust influence SBOCM? (4) How does online anonymity affect the relationship between perceived trust and SBOCM?

Through a literature review and a survey, we conduct an exploration of the formation process and outcomes of SBOCM, based on 538 valid questionnaires. We hope to contribute to the theoretical understanding of silent behavior in online contexts and provide practical guidance for the operational practices of online communities.

2. Literature Review

2.1. The concept of SBOCM

The study of silent behavior can be traced back to the field of organizational behavior research. Morrison and Milliken (2000) focus earlier on the phenomenon of silence in organizations, suggesting that the main reasons why employees withhold personal views on organizational problems are due to fears of negative results or a belief that their views are not important to the organization, and highlighting the important influence that top management and the organizational atmosphere have on the important influence of organizational silence (Lam and Xu, 2019). Existing research has predominantly concentrated on the negative impact of organizational silence on employee and organizational development, with less attention given to the positive effects of organizational silence on organizational performance (Morrison, 2023). Dyne (2003) considered that sometimes concealment is necessary and proposed positive employee silent behavior, arguing that employee silence intended to safeguard the interests of the organization may have a positive influence on organizational performance. Furthermore, he classified organizational silence into acquiescent silence, defensive silence, and prosocial silence.

In traditional organizational research, silence is often compared with voice (Bell et al., 2011; Lainidi et al., 2023; Morrison, 2023). Dyne et al. (2003) argue that the key feature distinguishing silence from voice lies not in whether or not an employee speaks up, but in their motivation to conceal ideas, information, and opinions related to work improvement. Based on the concepts of employee quiescence and acquiescence proposed by Pinder and Harlos (2001), Dyne et al. (2003) further categorized employee silence and voice into three types according to three motivations: disengaged behavior, self-protective behavior, and other-oriented behavior. Through comparing silence and voice, they found that both silence and voice can have positive and negative outcomes, but compared to voice, the motivations behind silence are more elusive, and observers are more likely to misattribute the reasons for employees' silence. Therefore, most existing studies categorize organizational silence from the perspective of motivation.

Due to the significant differences between face-to-face interactions in traditional organizations and the "human-computer-human" interactions in online communities, silent behavior in online communities differs from organizational silent behavior. Therefore, we conduct a comparative analysis with previous studies on silent behavior to further investigate the motivations and characteristics of SBOCM. Additionally, in online communities, the "silent majority" is defined as lurkers, meaning people who silently observe without participation or engagement in the community (Takahashi et al., 2003). Lurking is generally related to the absence of posting behavior (Edelmann, 2013). Consequently, numerous studies have conducted comparative analyses of the behaviors of lurkers and posters (Lai et al., 2014; Mousavi and Roper, 2023). Lurkers are usually perceived as free riders, yet in online communities, lurking is also an essential form of member participation (Yang et al., 2017). Sun et al. (2014) argue that a certain number of lurkers is necessary to maintain community order, and the existence of active lurkers (who disseminate information and knowledge acquired from online communities to others) is conducive to the promotion and development of the community. However, an excessive number of lurkers can lead to low posting rates and a lack of valuable content.

Table 1: Comparison of organizational silence behavior, lurker's behavior, and online community silence behavior

Definition	Motivation	Form	Reference
Organizational silence behavior of employees in organizations			
In many organizations, employees choose to withhold their opinions and concerns about organizational problems.	The climate of silence in the organization makes employees believe that it is unwise or dangerous to raise issues or opinions for fear of retaliation or affecting relationships.		Morrison and Milliken, (2000); Bell et al., (2011); Morrison (2023)
Employee silence is the withholding of any form of genuine expression about the individual's behavioral, cognitive and/or affective evaluations of his or her organizational circumstances to persons who are perceived to be capable of effecting change or redress.	The organization suffers from unfair treatment; The organization ignores the voices or concerns of its employees; There exists a cultural environment that suppresses communication within the organization.	Quiescence Silence; Acquiescence Silence	Pinder and Harlos, (2001); Bari et al., (2020)
Employees have relevant ideas, information, and opinions and yet choose not to express these ideas.	Employees believe that speaking up is pointless and unlikely to make a difference; Employees are intended to protect the self from external threats; Employees are motivated by altruism and cooperation.	Acquiescent Silence; Defensive Silence; ProSocial Silence	Dyne et al., (2003); Tangirala and Ramanujam (2008); Huang et al., (2023)
Lurker' behavior of users in online communities			
Online community users post occasionally or not at all but read the group's postings regularly.	Online community factors (group identity, usability, pro-sharing norm, reciprocity and reputation); Individual factors (personal characteristics, self-efficacy, goals, desires and needs); Commitment factors (affective commitment, normative commitment and continuance commitment); Security reasons.	Active lurkers; Passive lurkers	Takahashi et al., (2003); Edelmann (2013); Sun et al., (2014); Mousavi et al., (2023)
Silent behavior of online community members			
Members' behavior of choosing not to speak or participate in activities in an online community. Such behavior is usually related to non-public participation, inactivity, and silence.	Inability to change; Self-protection; Cooperation.	Acquiescent silent behavior of online community members; Defensive silent behavior of online community members; Prosocial silent behavior of community members	Pei et al., (2022)

To clearly define SBOCM, our study has conducted a detailed distinction between the concepts of SBOCM, organizational silent behavior, and lurking behavior (see Table 1). Firstly, the behavior of lurkers is somewhat different from that of SBOCM. Lurkers' behavior is primarily defined as the absence of posting, and in the study by Sun et al. (2014), lurkers are further categorized into active lurkers and passive lurkers. Active lurkers disseminate information and knowledge obtained from online communities to others, representing a positive form of community participation. Metrics such as likes, saves, and shares serve as visual indicators of active lurkers' behavior. Lurkers broadly refer to online users, while members of online communities are part of an interpersonal network formed by shared goals, thus comprising a smaller subset than lurkers. However, we argue that SBOCM is imperceptible to others, encompassing non-posting, non-commenting, non-liking, and non-forwarding. Secondly, compared to traditional organizations, the decentralized social network structure of online communities lacks hierarchical relationships and strict organizational systems (Garompolo et al., 2022). As a result, the motives for SBOCM differ from those of organizational silent behavior. Hence, we distinguish SBOCM from a motivational perspective, positing that such behavior can arise from both egoistic and altruistic motives. Drawing upon relevant literature on organizational silence and lurking behavior,

we categorize SBOCM into ACSB and PCSB. ACSB refers to members refraining from expressing their attitudes, opinions, and perspectives due to egoistic motives. In contrast, PCSB occurs when members remain silent for altruistic reasons, including refraining from publishing statements that could harm others or the community, not sharing others' private information, and not forwarding or liking content that could provoke conflict within the community.

Through detailed discussion and distinction, we extend the definitions of organizational silent behavior proposed by Pinder and Harlos (2001) and Dyne et al. (2003) to the context of online communities. Ultimately, SBOCM is defined as: due to egoistic or altruistic motives, online community members are unwilling to truly express their comments on the behavior, cognition and emotions of other members and the community, preferring to remain silent most of the time. Here, we have made some qualifications, and the online community members we study must meet the following conditions: (1) have logged into the online community and consider themselves as members of the online community, (2) browse the content of the online community, and (3) have relevant thoughts, information, or opinions about the online community or its members.

2.2. The concept of perceived trust in online communities

Based on social exchange theory, trust is the basis for the formation of social relationships between individuals and has always been a frontier research area in sociology (Schilke et al., 2021; Hsu et al., 2022). In previous studies on traditional organizations, attention was focused on the trust of employees in leaders or organizations (McEvily et al., 2003; Baer et al., 2015). However, compared to traditional organizations, we focus on online communities, which are characterized by decentralized social network structures, emphasizing autonomy in interpersonal relationships (Kaur et al., 2020). In this context, trust is a key factor that promotes voluntary online cooperation among strangers within online communities (Ridings et al., 2002), enabling online community members to engage in positive knowledge sharing behavior (Xie and Zhang, 2022). In addition, Blanchard et al. (2011) highlighted the significance of members' trust in the online community. This trust not only fosters attachment, identity, or loyalty to the community but also guides members to actively engage and contribute to the online community performance (Kim et al., 2023).

Therefore, our study attempts to comprehensively analyze the impact of perceived trust in online communities (PTOC) on SBOCM from two dimensions: interpersonal trust and climate of trust in the community, while dividing PTOC into perceived interpersonal trust in online communities (PITOC) and perceived climate of trust in online communities (PCTOC). In our study, PITOC refers to the subjective evaluation of trust relationships among the online community members, perceiving that other members will not behave harmfully but provide positive feedback, reflecting trust in the quality and capabilities of other members (Rotter, 1967; Wu et al., 2010); PCTOC refers to the subjective evaluation by online community members of the overall trustworthiness of the community, including identification, attachment, and loyalty to the community (Peng and Shin, 2016).

2.3. The concept of online community member performance

In the traditional organizational context, the concept of performance encompasses both organizational performance and employee performance, while online community performance similarly consists of two levels: the overall community performance and the online community member performance (Kumi and Sabherwal, 2018). The overall community performance can be evaluated through indicators such as community size, community influence, brand assets, and product diffusion speed, while the online community member performance is assessed based on their satisfaction, loyalty, and engagement (Hollebeek et al., 2014). Existing research has primarily focused on the performance of online brand communities. Wu et al. (2018) measured the participation performance of virtual brand communities through the Data Envelopment Analysis (DEA) method, considering factors such as visit frequency, purchase expenditure, purchase frequency, and WOM frequency. Additionally, Confente and Kucharska (2021) used brand performance (brand loyalty attitudes and brand loyalty behaviors) and consumer performance (personal branding) to assess the performance of brand communities. However, we focus on communities in the context of social media, including trade-oriented, interest-based, and fantasy-oriented communities, and explore the impact of SBOCM on online community performance from the perspective of online community members (OCMP), thus underscoring the significance of online community member performance, specifically, the contributions and value members provide to the community.

Unlike employee performance in traditional organizations, online community members are not bound by task metrics and often participate voluntarily (Jahan and Kim, 2021). Therefore, OCMP refers to the voluntary contributions made by members of the online community, manifested in their collective willingness to participate in activities and share information within the community, as well as to recommend and endorse the community externally to enhance its influence (Pei, 2022).

2.4. The concept of online anonymity

Online anonymity is one of the main characteristics of online communities. According to past studies, there are two main categories of anonymity in a virtual environment: technical anonymity and social anonymity (Christopherson, 2007). Technical anonymity refers to the deletion of all meaningful identifying information about

others during the material exchange process. Social anonymity refers to the perception of others or oneself as unidentifiable due to the lack of clues that can be used to attribute an identity to the individual. Analogously, Christopherson (2007) defined online anonymity as "the inability of others to identify an individual or for others to identify one's self." The interaction form of "human-computer-human" in online communities allows members a certain degree of autonomy to construct a virtual image that others cannot identify as their real identity (Jung, 2011; Smirnova et al., 2022). In other words, in the context of online communities, anonymity refers to the individual's perception that they are anonymous to others. Therefore, we refer to Christopherson's (2007) definition of online anonymity and define it as the extent to which online community members believe that others cannot identify their real identity.

Existing research has found that online anonymity can stimulate autonomy perception and subsequently facilitate self-disclosure behavior among community members. Specifically, the more online anonymous are, the less worried they are about expressing their opinions. In the field of communication, Scott (1998) early on proposed that self-disclosure is a common result of anonymity (Clark-Gordon et al., 2019). In virtual environments, people (especially shy individuals) are more willing and courageous to engage in self-disclose, promoting interaction and communication (Walther, 1996; Pan et al., 2023; Wang et al., 2024). Furthermore, decentralized online communities lack centralized control and people feel more unconstrained in virtual environments, which could potentially lead to uncivil and unethical behavior (Christopherson, 2007; Kim et al., 2019), thereby undermining the interests of community. Although online anonymity provides a relatively safe environment for members to communicate, it can also lead to abuse by some members, such as fraud, defamation, or other unethical behaviors, ultimately harming the overall interests of the community. This can result in uncertainty that hinders the development of trust among individuals (Mayer et al., 1995). To further explore the impact of PTOC on SBOCM, we incorporate online anonymity into the theoretical model to study its impact on SBOCM.

2.5. The concept of social exchange theory

Social exchange theory, a sociological theory that arose in the 1950s, is the most influential theory to understand interpersonal relationships. It is widely used in anthropology, social psychology, sociology and other fields. Blau (1964) argues that the foundation of social exchange lies in acquiring rewards, further categorizing rewards people desire into "external rewards" (such as money, goods, and services) and "internal rewards" (such as love, respect, honor, and positions). In social exchange, people will predict whether the rewards they obtain through participation in the exchange are satisfactory. Based on the principle of reciprocity, people are willing to maintain an exchange relationship with others only when they expect to receive satisfactory returns (Homans, 1974).

In online communities, the interaction behaviors among online community members are considered a form of social exchange (Jahan and Kim, 2021), and SBOCM is also a kind of interactive behavior. According to social exchange theory, positive feedback—such as information, knowledge, and emotional support—is what members expect in return (Zhang and Liu, 2022). When members predict that they will receive positive feedback, they are likely to engage in proactive behaviors, which include reducing ACSB which is detrimental to the online community, and increasing PCSB which benefits the online community. Specifically, when members perceive the possibility of receiving positive feedback, they will diminish their self-protection mechanisms, making them more willing to participate in online community activities, which in turn reduces ACSB. From an altruistic perspective, the expectation of positive feedback leads members to prioritize the maintenance of harmonious community relationships over their personal desires for expression. Consequently, to avoid escalating conflicts and to preserve the community's harmonious atmosphere, they are more likely to engage in PCSB. Conversely, when members expect to struggle in obtaining positive feedback, they tend to exhibit negative behaviors, characterized by an increase in ACSB and a decrease in PCSB. This is because the anticipated rewards are perceived as lower than the costs incurred by their participation; thus, members adjust their behaviors, engaging less actively and demonstrating increased ACSB. Additionally, due to these negative expectations, altruistic motivations among members are correspondingly diminished, resulting in a decrease in PCSB.

Given that members' expectations of feedback are based on subjective perceptions that are inherently difficult to measure and contain elements of uncertainty, trust plays a crucial role in the social exchange behaviors within online communities. When members perceive a sense of trust, they are more inclined to believe that their contributions will yield positive feedback (Kim et al., 2023), thereby making it more likely that they will reduce ACSB and increase PCSB. Existing research primarily applies social exchange theory to explain more readily identifiable participation behaviors in online communities (Kao et al., 2020; Urbonavicius et al., 2021; Degutis et al., 2023), while less attention has been paid to SBOCM.

2.6. Research Review

In summary, we analyze the existing literature and identify the following gaps: (1) There is a lack of research focusing on SBOCM. To address this gap, it is essential to explore the characteristics and components of SBOCM;

(2) Interpersonal trust and climate of trust are crucial for the construction of social relational networks, and this is equally true in the context of online communities. Therefore, it is necessary to investigate the impact of PTOC on SBOCM; (3) OCMP is a key measure of online community operation, making it important to explore the impact of SBOCM on OCMP; (4) Online anonymity has a complex effect on the behavior of online community members, and examining how the degree of online anonymity influences the relationship between perceived trust and silent behavior is a topic worthy of attention; (5) Social exchange theory is often applied to explain readily observable active participation behaviors, but less focus has been placed on silence behavior. In social exchange, individuals perform behaviors based on their evaluations of expected returns; thus, silent behavior in online communities is also a significant social exchange phenomenon. Consequently, social exchange theory can effectively explain the relationship between silent behavior, perceived trust, and performance among online community members. Thus, our research will investigate the impact of PTOC on SBOCM and its effects on OCMP, with online anonymity considered as a boundary condition for further examination.

3. Research Hypotheses

3.1. SBOCM and OCMP

We measure online community performance from the perspective of online community members, positing that the degree to which members are willing to contribute to the community is the best reflection of its performance (Masson and Parmentier, 2023). This willingness is specifically manifested in members participating in activities and sharing information within the community, as well as recommending and appreciating the community, and inviting others outside the community. Based on previous research and from a motivational perspective, we categorize SBOCM into ACSB and PCSB. ACSB refers to behaviors in which members remain silent due to egoistic motives. This type of silence hinders the circulation of diverse information within the community and has adverse effects on community development; therefore, we argue that ACSB negatively impacts community member performance. On the other hand, PCSB occurs when members choose to remain silent for altruistic motives. This behavior can, to some extent, help avoid conflicts within the community and maintain a positive interaction atmosphere, which is beneficial for the sustainable development of the community. Consequently, we posit that PCSB has a positive influence on OCMP.

Specifically, ACSB leads to a reduction in valuable information within the community, causing members to perceive that the community is not worth their contributions. This results in a decreased willingness among community members to contribute, negatively affecting OCMP. Conversely, PCSB is grounded in altruistic motives and reduces the prevalence of unethical or malicious information within the community. This fosters positive interactions among community members (Tseng et al., 2022) and allows members to perceive the goodwill of the community more easily, contributing to increased satisfaction and a greater willingness to contribute. Therefore, we propose the following hypotheses:

H1a: ACSB has a negative impact on OCMP.
H1b: PCSB has a positive impact on OCMP.

3.2. PTOC and SBOCM

Effect of PITOC on SBOCM. According to social exchange theory, an individual's perception of trust in other members influences their behavior (Jahan and Kim, 2021). Trust is a psychological state in which an individual willingly exposes their weaknesses to others without fear of exploitation. Based on social exchange theory, both parties engaged in exchanges are more likely to conduct further exchange behaviors on the foundation of mutual trust, thereby maintaining their exchange relationships (Zhang and Liu, 2022). With trust as the basis, online community members believe that other members will provide satisfactory returns, making them more inclined to engage in positive behaviors. This includes reducing ACSB driven by egoistic motives and increasing PCSB motivated by altruism.

Specifically, when PITOC is high, community members are more likely to predict positive feedback, which includes receiving information or emotional support and not being subjected to hostile treatment. According to the principle of reciprocity, these predictions of positive feedback will encourage online community members to engage in proactive behaviors, such as reducing ACSB by actively expressing their viewpoints and opinions, thereby fostering a favorable exchange relationship. At the same time, it will also increase PCSB, such as refraining from malicious attacks on others and avoiding the indiscriminate exposure of personal information.

Conversely, when PITOC is low, community members are likely to have reduced predictions for positive feedback and increased predictions for negative feedback. Driven by egoism and a desire to protect themselves from harm, online community members may increase their ACSB and even decrease their PCSB in response to negative feedback. Therefore, we propose the following hypotheses:

H2a: PITOC has a negative impact on ACSB.
H2b: PITOC has a positive impact on PCSB.

Effect of PCTOC on SBOCM. Trust in the community is essential for community members' willingness to interact with others (Mayer, 1995). According to previous studies, individual perceptions of the environment have a significant impact on their psychology and behavior. Tu et al. (2017) suggested that the climate of trust can establish effective communication channels, facilitating the development of social and emotional connections among team members, leading to more extensive involvement in interactions (Vriens, 2018). According to social exchange theory, the PCTOC facilitates the establishment of long-term relationships between community members and the community, as it simultaneously triggers the reciprocity norm and the rank equilibrium norm (Kao et al., 2020). Therefore, we assume that, on one hand, when there is a higher PCTOC, signifying that the online community is considered trustworthy, members are more likely to express their opinions and are more willing to contribute to the community, which in turn reduces instances of ACSB by egoism (Blanchard et al., 2011). On the other hand, PCTOC enhances the sense of belonging and identification among community members, igniting a protective motivation towards the community (Jahan and Kim, 2021). Thus, when there is a high PCTOC, members may choose not to disclose certain information or refrain from using malicious remarks to protect others and the community's interests, and are more inclined to engage in PCSB. Accordingly, the following hypotheses are presented:

H3a: PCTOC has a negative impact on ACSB.
H3b: PCTOC has a positive impact on PCSB.

3.3. Mediating role of SBOCM

According to social exchange theory, one is willing to believe that the other will offer a corresponding return in the future, which is critical for the sustenance of social exchange relationships (Granovetter, 2018). Trust is the basis for social exchange. When there is a high PTOC, members are more inclined to engage in exchange behaviors, thereby contributing to the achievement of the community's objectives. Specifically, we discuss trust from two dimensions: PITOC and PCTOC. On one hand, PITOC directly influences communication openness (Edmondson, 1999). Only when online community members trust each other, believing that others will not engage in behavior detrimental to themselves, are they willing to actively ask questions, and genuinely share knowledge and experience within the community, which increases community participation. Interactions among community members are beneficial for promoting the attainment of common objectives, thereby enhancing community member satisfaction and contributing value to the community (Mcallister, 1995; Masson and Parmentier, 2023). On the other hand, PCTOC is a subjective evaluation of the overall reliability of the online community based on its values, rules, and other factors. Sherf et al. (2021) found that individuals' perception of trust in the organizational environment affects their psychological sense of safety, and employees lacking a sense of psychological safety tend to remain silent. Similarly, we posit that PCTOC affects their willingness to participate. When there is a higher PCTOC, online community members are more likely to identify with the community and engage in interactions, as well as recommend the community to others, thereby improving OCMP. Based on the above, the following hypotheses are proposed:

H4a: PITOC has a positive impact on OCMP.
H4b: PCTOC has a positive impact on OCMP.

Social exchange theory posits that all social activities can be understood as exchange processes based on the principle of reciprocity between individuals. People are willing to maintain exchange relationships with others only if they predict to receive corresponding rewards (Homans, 1974). From the perspective of social exchange theory, the SBOCM is viewed as a result of exchanges among members (Jahan and Kim, 2021).

Based on the principle of reciprocity in social exchange theory, when online community members perceive trust, their belief in the expectation of receiving positive feedback is strengthened. They become more willing to believe that if they engage in positive behaviors, they will receive corresponding positive feedback, thus increasing their willingness to engage in such behaviors. Consequently, perceived trust motivates online community members to reduce ACSB and increase PCSB, thereby positively influencing OCMP.

Specifically, as perceived trust increases, online community members are more likely to believe that their exchange behaviors within the community are reciprocal. They are confident that their actions will garner positive feedback and not result in being ignored or in conflicts that could harm them. This leads to a reduction in ACSB, thereby positively impacting OCMP. Conversely, when perceived trust is low, social exchange relationships become

difficult to establish, and online community members may not believe that their actions will yield positive feedback. Driven by self-protective motives, they may choose to engage in ACSB, which in turn decrease OCMP.

On the other hand, as perceived trust increases, the negative feedback that online community members predict will also decrease. In other words, based on the principle of reciprocity, when members believe that they will not be subjected to malicious attacks or have their personal information leaked, they are less likely to treat others in such a manner. Thus, motivated by altruism, online community members will refrain from expressing, sharing, or liking malicious statements that harm others, resulting in PCSB. This contributes to fostering a harmonious and friendly community environment, positively affecting OCMP. Conversely, when perceived trust is low, social exchange relationships become difficult to maintain, leading members to reduce their commitments to engage in PCSB, which negatively impacts OCMP. Based on these contexts, the following hypotheses are proposed:

H5a: ACSB mediates the relationship between PTOC and OCMP.
H5b: PCSB mediates the relationship between PTOC and OCMP.

3.4. Moderating role of online anonymity

Online anonymity is the extent to which online community members believe that others cannot identify their real identity. Research has shown that online anonymity, due to its characteristics of reduced self-cue recognition, can facilitate positive expression among community members (Luarn and Hsieh, 2014). As the degree of online anonymity increases, members are more likely to believe that others cannot identify their true identities, which diminishes their fear of anticipated negative feedback. Therefore, in high online anonymity conditions, the stronger the perceived trust among community members, the more they are inclined to believe they will receive positive feedback. Even if they anticipate negative feedback, their tendency to withdraw is lessened, making them more willing to engage in positive interaction and significantly reducing ACSB.

Additionally, other studies have indicated that online anonymity, due to its lack of constraints, can more readily lead to uncivil or unethical behaviors (Kim et al., 2019). In situations of high online anonymity, lower levels of perceived trust make it more difficult for members to believe they will receive positive feedback, potentially leading to harmful behaviors towards others or the online community, such as disclosing personal information, engaging in hostile interactions, and disparaging the online community. This, in turn, significantly reduces PCSB.

In summary, we argue that online anonymity strengthens the relationship between PTOC and SBOCM. Specifically, when online anonymity is high, the negative impact of PTOC on ACSB is enhanced, while the positive impact of PTOC on PCSB is also amplified. Based on the above analysis, the following hypotheses are proposed:

H6a: Online anonymity moderates the negative impact of PTOC (PITOC and PCTOC) on ACSB. Specifically, a higher level of online anonymity strengthens the negative impact of PTOC on ACSB, and vice versa.

H6b: Online anonymity moderates the positive impact of PTOC (PITOC and PCTOC) on PCSB. Specifically, a higher level of online anonymity strengthens the positive impact of PTOC on PCSB, and vice versa.

Based on the above arguments and analysis, the research model is summarized in Figure 1.

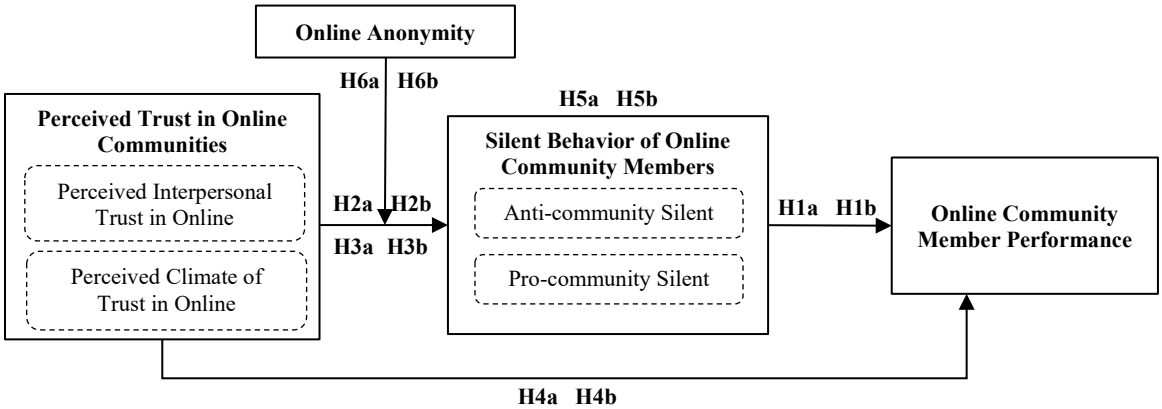

Figure 1: Research Model

4. Research Design

4.1. Data collection and questionnaire design

The design and data collection steps for the questionnaire are as follows: (1) Development of the initial scale. From October 2019 to January 2020, we referenced established scales used in previous literature to create the original scale. Using a back-translation method, the scale was translated from English to Chinese. Five experts familiar with online community operations made appropriate modifications to the mature scale on organizational silence behavior, ensuring that the original items were retained as much as possible. The scale was then translated back into English. Meanwhile, to ensure that participants met the criteria for our study, we initially asked participants, "What is the most interesting community you have joined?" to confirm their identification as community members. Additionally, we included personal demographic information and the level of participation in online communities at the beginning of the questionnaire. The question "How much time do you spend visiting this online community each day?" included a "Do not visit" option to filter out participants who do not engage with the community. Furthermore, we included the question "I have no willingness to participate in activities organized by this online community," where only those who answered "Strongly Disagree" could proceed with the questionnaire; otherwise, they were directed to exit the survey. The questionnaire adopted a five-point Likert-type scale, from 1 (Strongly disagree) to 5 (Strongly agree). (2) Pre-survey. From January 2020 to March 2020, a pre-survey was conducted using 150 questionnaires in three large online communities commonly used by Chinese netizens - WeChat, QQ, and Douban Groups. Feedback was collected from online community members on the completion of the questionnaire, and issues with unclear conceptual explanations and unclear item descriptions were improved. Subsequently, 1090 questionnaires were collected from a professional platform of Questionnaire Star in March, and after excluding 316 invalid questionnaires due to short completion time, serious data loss, and non-serious filling (using reverse-items for measurement), a total of 774 valid questionnaires were obtained. The questionnaire data was then tested for reliability and validity, and based on the results and the characteristics of the online community; the original scale was revised to form a preliminary measurement scale for the dimensions of ACSB and PCSB. (3) Formal survey. From December 2021 to January 2022, 785 questionnaires were collected through the online survey platform of Credamo, which is similar to MTurk and is a widely used online survey platform (Li et al., 2023). After excluding questionnaires with short completion times, serious data loss, and non-serious filling, a total of 538 valid questionnaires were obtained.

4.2. Variable measurement

The measurement items for the variables were sourced from established scales, as shown in Table 2. SBOCM refers to a mature scale based on Zheng et al. (2008) and Dyne (2003), which included a total of 11 items, including 6 items for ACSB and 5 items for PCSB. PTOC encompasses both PITOC and PCTOC. The measurement of PITOC refers to the established scales of Wu (2010) and Rotter (1967), consisting of 5 items. The measurement of PCTOC refers to the scales developed by Peng and Shin (2016) and Koh and Kim (2003), which included 3 items. OCMP refers to Ahmad and Schroeder (2003) and Pei et al. (2022), comprising 5 items. Online anonymity (OA) was assessed using a scale adapted from Chen et al. (2019), which included 3 items. Control variables included demographic factors such as Gender, Age, and Education Level, as well as factors closely related to online community member participation, including Types of Community, Time to Join the Community, Access Frequency, and Access Time.

Table 2: Survey Items

PITOC	Adapted from Wu et al. (2010) & Rotter (1967)	Factor load
PI 1	In this community, I feel that community members trust each other.	0.648
PI 2	In this community, I would interact with others more sincerely.	0.727
PI 3	In this community, when I make agreements with other members, I believe that they will abide by our commitments.	0.636
PI 4	In this community, if I share my problems with the members, I feel that I will receive advice and assistance from other members.	0.678
PCTOC	Adapted from Peng and Shin (2016) & Koh and Kim (2003)	Factor load
PC 1	I feel a strong sense of belonging to the community I have joined.	0.692
PC 2	I rely heavily on the community I have joined.	0.635
PC 3	I am very willing to let others know that I am a member of this community.	0.696
ACSB	Adapted from Zheng et al. (2008) & Dyne (2003)	Factor load
AC 1	I am afraid that my comments will affect the interpersonal relationships among online community members, and even if I do not agree with others' comments, I choose to remain silent.	0.765
AC 2	It's better to hold back in the online community and not express my views, so as not to become a target of public criticism.	0.794

AC 3	I do not speak out because I am afraid of receiving negative responses from the organizers or other members of the online community.	0.768
AC 4	I think it is unnecessary to speak out and offend other members of the community.	0.734
AC 5	I believe that the likelihood of the online community management adopting my suggestions is very low, so it is unnecessary to speak out.	0.713
AC 6	I usually lurk in the online community without much presence. Whether or not I speak out is not important.	0.733
PCSB	Adapted from Zheng et al. (2008) & Dyne (2003)	Factor load
PC 1	I trust the members in the online community I joined, and I believe that the comments of other members can solve the current issues in the community.	0.645
PC 2	I choose not to speak out in order to maintain harmony within the community.	0.648
PC 3	When the decisions made by community members after discussion may bring problems, I choose not to speak out because I already have a solution in mind.	0.666
PC 4	To maintain the overall image of the community, I consciously conceal negative information about the community.	0.652
PC 5	Out of concern for the members of the community, I will appropriately protect the privacy of the information within the community.	0.588
OCMP	Adapted from Ahmad and Schroeder (2003) & Pei et al. (2022)	Factor load
OC 1	Compared to similar communities, members of our community are more willing to share.	0.662
OC 2	Compared to similar communities, members of our community are more willing to participate in community activities.	0.613
OC 3	Compared to similar communities, I am more willing to recommend our community to friends.	0.677
OC 4	Compared to similar communities, I am more willing to invite friends to join our community.	0.669
OC 5	Compared to similar communities, I am more inclined to praise and commend our community to others.	0.604
OA	Adapted from Chen et al. (2019) & Fan and Ma (2009)	Factor load
OA 1	I engage anonymously in the community to feel more comfortable.	0.622
OA 2	I engage anonymously in the community to speak freely.	0.865
OA 3	I engage anonymously in the community to perform my true self.	0.821

4.3. Reliability and validity testing

In this study, we utilized SPSS 23.0 and AMOS 24.0 statistical software to analyze the data collected from the formal survey. Each variable underwent reliability and validity testing.

Reliability Testing. We first performed Exploratory Factor Analysis (EFA) using SPSS 23.0. The results indicated a KMO value greater than 0.8, with significance levels of 0.000, suggesting that the data was highly suitable for factor analysis. The EFA results demonstrated that the items measuring SBOCM significantly clustered into two common factors. The meanings of these items clearly reflected the characteristics of PCSB and ACSB, further validating the reasonableness of this distinction. Additionally, the cumulative explained variance contribution was 62.254%. Table 3 presents the rotated matrix obtained through the maximum variance rotation method, providing important insights into the structural relationships between the factors. The reliability test results (see Table 4) showed that the overall Cronbach's α for PTOC was 0.804, for SBOCM was 0.822, for OCMP was 0.781, and for OA was 0.873.

Validity Testing. We conducted Confirmatory Factor Analysis (CFA) using AMOS 24.0. The results indicated that all factor loadings were greater than 0.5 (see Table 2), with AVE values meeting acceptable thresholds and the composite reliability (CR) values exceeding 0.7. We also further assessed discriminant validity, and the results showed that the square roots of the AVE for each variable were greater than the absolute values of the correlations between the variables, indicating strong discriminant validity (see Table 4).

Table 3: Rotational component matrix

	Components					
	1	2	3	4	5	6
PITOC 1	0.707					
PITOC 2	0.623					
PITOC 3	0.635					
PITOC 4	0.772					
PCTOC 1		0.721				
PCTOC 2		0.776				
PCTOC 3		0.536				
ACSB 1			0.793			
ACSB 2			0.835			
ACSB 3			0.788			
ACSB 4			0.738			
ACSB 5			0.734			
ACSB 6			0.724			
PCSB 1				0.705		
PCSB 2				0.741		
PCSB 3				0.705		
PCSB 4				0.720		
PCSB 5				0.687		
OCMP 1					0.683	
OCMP 2					0.514	
OCMP 3					0.756	
OCMP 4					0.788	
OCMP 5					0.636	
OA 1						0.875
OA 2						0.871
OA 3						0.869
Cumulative variance interpretation: 62.254%						

Table 4: Basic descriptive statistics of the correlation coefficients

	Mean	SD	*PITOC*	*PCTOC*	*ACSB*	*PCSB*	*OCMP*	*OA*
PITOC	4.203	0.560	0.673					
PCTOC	4.068	0.650	0.509***	0.675				
ACSB	2.384	0.900	-0.375***	-0.394***	0.752			
PCSB	3.390	0.823	0.134***	0.118***	0.218***	0.640		
OCMP	4.215	0.575	0.539***	0.481***	-0.298***	0.133***	0.649	
OA	3.723	0.993	0.028	0.008	0.188***	0.258***	0.093***	0.836
CR			0.768	0.715	0.886	0.776	0.784	0.874
AVE			0.453	0.456	0.565	0.410	0.422	0.699
Cronbach's α			0.768	0.712	0.885	0.774	0.781	0.873

Notes: N=538; Abbreviations: AVE, average variance extractions; CR, composite reliability; Diagonals represent the square root of the average variance extractions (AVE); *p<0.1, **p<0.05, ***p<0.01.

4.4. Common Method Bias

We employed the three-step approach proposed by Podsakoff et al. (2003) to address common method bias. Firstly, we improved the definition of each measurement item by adjusting and refining the questionnaire. Secondly, we conducted two rounds of pre-surveys and one formal survey. Lastly, we arranged the items in the questionnaire in a relatively random order to minimize participants' anticipation of the intended survey outcomes. During the survey, we assured participants that their responses would be handled anonymously to protect their privacy and alleviate any concerns that might affect the accuracy of their responses. Additionally, we employed Harman's single-factor method by including all measurement items of each construct in an exploratory factor analysis. The results revealed that the unrotated first factor accounted for 23.957% of the total variance, falling below the standard threshold of 40%. This indicates that common method variance was not a significant issue in this study. Therefore, there is no significant concern regarding common method bias.

5. Results

5.1. Descriptive Statistics

The descriptive statistics are presented in Table 5. Among the 538 valid responses, 65.43% were females, while 34.57% were males. Regarding age, 27.51% were aged 18-25, 27.32% were 26-30, and 27.51% were 30-35. Among the community types, 57.43% were most interested in Interest-based communities, 33.46% preferred Trade-oriented communities, and the least interested were in Fantasy-oriented communities, accounting for 9.11%. Regarding the duration of community membership, 70.8% had been members for over 6 months, 17.1% for 3-6 months, and 12.1% for less than 3 months. With regard to access frequency, 51.1% visited often, followed by 25.5% who visited always.

Table 5: Statistical description

Dimension	N=538	Percent (%)	Dimension	N=538	Percent (%)
Gender			**Types of community**		
Man	186	34.57	Interest-based community	309	57.43
Female	352	65.43	Trade-oriented community	180	33.46
Age			Fantasy-oriented community	49	9.11
18~25	148	27.51	**Time to join the community**		
26~30	147	27.32	Under 3 months	65	12.1
31~35	148	27.51	3~6 months	92	17.1
36~40	72	13.38	6 months~1 year	148	27.5
41~50	12	2.23	1 year or more	233	43.3
51 or more	11	2.04	**Access frequency**		
Education level			Sometimes visit	100	18.6
Below secondary school	13	2.42	Often visit	275	51.1
Vocational secondary school	13	2.42	Always visit	137	25.5
Undergraduate	470	87.36	Unsure	26	4.8
Master's degree or above	42	7.81	**Access time**		
			Less than 0.5h	134	24.9
			0.5~1h	305	56.7
			1~3h	99	18.4

5.2. Hypothesis testing

This study used SPSS 23.0 to conduct step-by-step regression analysis to test the research hypotheses, and the results are shown in Table 6.

Table 6: Results of multiple regression analysis

	DV=*OCMP*		**DV=*ACSB***		**DV=*PCSB***		**DV=*OCMP***		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Control Variable									
Gender	0.143***	0.101**	-0.077*	-0.035	0.102**	0.08*	0.08**	0.078**	0.075***
Age	0.038	-0.012	-0.080*	-0.018	0.138***	0.106**	-0.051	-0.052	-0.058
Education level	0.110**	0.106**	0.019	0.069*	0.043	0.016	0.033	0.035	0.032
Types of community	-0.081*	-0.073	0.020	-0.023	-0.011	0.011	-0.018	-0.019	-0.019
Time to join the community	0.131***	0.089	-0.234***	-0.168***	-0.104**	-0.14***	0.028	0.022	0.037
Access frequency	0.046	0.038	-0.008	0.036	0.031	0.009	-0.018	-0.017	-0.019
Access time	0.151***	0.116***	-0.216***	-0.154***	-0.112**	-0.145	0.060	0.054	0.069*
Independent Variable									
PITOC				-0.211***		0.124**	0.384***	0.376***	0.376***
PCTOC				-0.212***		0.101**	0.264***	0.256***	0.257***
Intermediary Variable									

ACSB		-0.271***						-0.037	
PCSB		0.208***							0.063*
R^2	0.104	0.187	0.144	0.252	0.052	0.083	0.363	0.364	0.367
Adjusted R^2	0.092	0.173	0.133	0.239	0.039	0.067	0.352	0.352	0.355
F	8.784***	13.502***	12.748***	19.755***	4.141***	5.302***	33.457***	30.190***	30.527***
Notes: *p<0.1, **p<0.05, ***p<0.01.									

Model 2 examined the influence of SBOCM on OCMP. The results indicated that ACSB (β=-0.271, p<0.01) had a significant negative impact on OCMP, supporting H1a. Meanwhile, PCSB (β=0.208, p<0.01) positively influenced OCMP, supporting H1b. Model 4 incorporated control variables and introduced PTOC as an independent variable to test its impact on ACSB. The results showed that PTOC had a significant negative impact on ACSB (β=-0.211, p<0.01; β=-0.212, p<0.01), supporting H2a and H3a. Model 6 examined the impact of PTOC on PCSB, revealing a significant positive effect (β= 0.124, p<0.05; β= 0.101, p<0.05), thereby H2b and H3b were supported. Model 7 introduced PTOC as an independent variable after including control variables. The results revealed that both PITOC (β=0.384, p<0.01) and PCTOC (β= 0.264, p<0.01) had significant positive impacts on OCMP, thus H4a and H4b were supported.

Models 8 and 9 tested the mediating effects of SBOCM. Based on Model 7, Model 8 added ACSB as a mediating variable, while Model 9 included PCSB as a mediating variable. The results showed that ACSB did not mediate the relationship between PTOC and OCMP (β=-0.037, p>0.1), disproving H5a. However, PCSB (β=0.063, p<0.1) partially mediated the relationship between PTOC and OCMP. Furthermore, we conducted a bootstrap test of the mediating effect of PCSB using Model 4 in SPSS PROCESS (Table 7). The findings reveal that the 95% confidence interval bounds for the mediating effect of PCSB in the relationship between PITOC and PCTOC on OCMP exclude 0, suggesting the mediating effect of PCSB is significant. Therefore, H5b is supported.

Table 7: Total effect, direct effect and mediating effect

Path	Effect	SE	95%CI	
			LLCI	ULCI
PITOC-PCSB-OCMP				
Total effect	0.5059	0.0393	0.4286	0.5831
Direct effect	0.4920	0.0397	0.4140	0.5700
Indirect effect	0.0139	0.0083	0.0009	0.0325
PCTOC-PCSB-OCMP				
Total effect	0.3858	0.0369	0.3132	0.4583
Direct effect	0.3720	0.0371	0.2991	0.4449
Indirect effect	0.0138	0.0082	0.0013	0.0331

We conducted an examination of the moderating impact of online anonymity, as detailed in Table 8. Prior to assessing the moderating effect, the interaction term between the independent variable (PITOC & PCTOC) and the moderating variable (OA) was constructed, and the variables were centered to mitigate issues associated with multicollinearity. Model 11 extends Model 10 by including an interaction term to examine the moderating role of OA between PTOC and SBOCM. The results reveal that the interaction term between PITOC and OA is significant (β = -0.137, p < 0.01). Conversely, the regression coefficient of the interaction term between PCTOC and OA fails to reach significance (β = -0.067, p > 0.1). Model 13 builds upon Model 12 by incorporating the interaction term, demonstrating that the interaction term between PTOC and OA does not show statistical significance in predicting PCSB (β = -0.006, p > 0.1; β = -0.032, p > 0.1), indicating that OA does not moderate the impact of PTOC on PCSB. Consequently, OA is found to negatively moderate the influence of PITOC on ACSB, thus partially supporting H6a, while failing to support H6b. To depict the moderating influence of OA between PITOC and ACSB, a moderation effect plot is generated based on the test outcomes, as illustrated in Figure 2.

Table 8: The effect of moderation

	DV=*ACSB*		DV=*PCSB*	
	Model 10	Model 11	Model 12	Model 13
Control Variable				
Gender	-0.069*	-0.083**	0.040	0.038
Age	-0.042	-0.028	0.079*	0.081*
Education level	0.062	0.043	0.008	0.005
Types of community	-0.020	-0.032	0.015	0.013
Time to join the community	-0.135***	-0.145***	-0.103**	-0.105**
Access frequency	0.052	0.048	0.027	0.026
Access time	-0.132***	-0.123***	-0.120***	-0.120***
Independent Variable				
PITOC	-0.221***	-0.258***	0.112**	0.105**
PCTOC	-0.217***	-0.233***	0.096*	0.095*
Moderator Variable				
OA	0.175***	0.194***	0.199***	0.204***
Interaction Term				
*PITOC*OA*		-0.137***		-0.006
*PCTOC*OA*		-0.067		-0.032
R^2	0.278	0.311	0.117	0.118
Adjusted R^2	0.265	0.295	0.100	0.098
F	20.332***	19.723***	6.996***	5.874***

Notes: *p<0.1, **p<0.05, ***p<0.01.

In summary, to visually present the verification results of this study, we have compiled a summary table of hypothesis testing results, as shown in Table 9.

Table 9: Structural path analysis

Hypothesis	Path	Estimate	Findings
H1a	PITOC → ACSB	-0.211***	Supported
H1b	PITOC → PCSB	0.124**	Supported
H2a	PCTOC → ACSB	-0.212***	Supported
H2b	PCTOC → PCSB	0.101**	Supported
H3a	ACSB → OCMP	-0.271***	Supported
H3b	PCSB → OCMP	0.208***	Supported
H4a	PITOC → OCMP	0.384***	Supported
H4b	PCTOC → OCMP	0.264***	Supported
H5a	PTOC → ACSB → OCMP	-0.037	Not Supported
H5b	PTOC → PCSB → OCMP	0.063*	Supported
H6a	PITOC*OA → ACSB	-0.137***	Supported
	PCTOC*OA → ACSB	-0.067	Not Supported
H6b	PITOC*OA → PCSB	-0.006	Not Supported
	PCTOC*OA → PCSB	-0.032	Not Supported

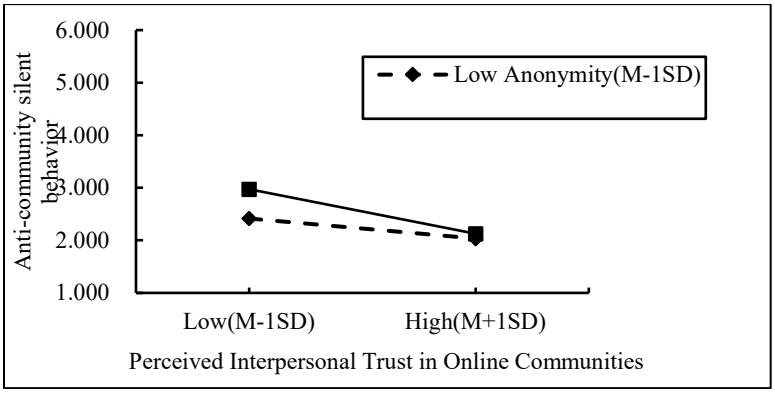

Figure 2: The moderating role of online anonymity on PITOC and Anti-community silent behavior

6. Discussion and implications

Based on the social exchange theory, we deeply studied the influence of PITOC and PCTOC on SBOCM and further analyzed how these behaviors affected OCMP. This research not only enriches the application of social exchange theory in online community environments but also provides a new perspective for studying SBOCM, making significant theoretical contributions.

First, through exploratory factor analysis, we divided SBOCM into ACSB and PCSB and developed the SBOCM scale. At the same time, we distinguish organizational silent behavior, lurking behavior, and SBOCM. Although these behaviors appear similar on the surface, involving reducing or avoiding publicly expressing opinions in specific environments, they differ in the context, motivation, and consequences of their occurrence. Therefore, this distinction helps researchers more accurately identify and analyze silent behaviors in different contexts, laying a solid theoretical foundation for subsequent empirical research.

Second, we verify that PTOC has a significant positive impact on PCSB and a negative impact on ACSB, further validating the applicability of social exchange theory in online community environments. As Chiu et al. (2006) argued, a high-trust interpersonal environment can indeed promote active participation among community members, motivating them to make behaviors beneficial to the community. This finding not only provides theoretical support for our understanding of trust mechanisms in online communities but also offers new research directions for subsequent studies.

Third, we demonstrate the impact of SBOCM on OCMP and reveal the double-edged sword effect of silent behaviors in community operations and management. This aligns with the findings of Pei et al. (2022) regarding the double-edged sword effect of SBOM. However, we classify SBOCM into ACSB and PCSB, with ACSB having a negative effect and PCSB having a positive effect on OCMP. Most research on online community management often views silent behavior as a single, negative phenomenon, while we reveal the complexity and diversity of SBOCM by distinguishing between negative ACSB and positive PCSB.

Fourth, we find that ACSB does not significantly mediate the relationship between PTOC and OCMP. In contrast, PCSB mediates the relationship between PTOC and OCMP. The insignificant mediating effect of ACSB suggests that it may not be a crucial factor in enhancing OCMP through PTOC. This finding aligns with Herzberg's two-factor theory (2017), where PTOC resembles hygiene factors that can reduce ACSB but are not direct incentive factors affecting OCMP. Consequently, to enhance OCMP, online community managers need to focus on other incentive factors beyond trust perception, such as providing incentives and enhancing community identification. Unlike ACSB, PCSB is a proactive behavior motivated by altruism and maintaining community harmony. This silent behavior is actually a beneficial contribution to the community. When PTOC is high, members are more likely to adopt PCSB, thereby maintaining community stability and harmony and enhancing OCMP. This finding emphasizes the importance of community managers in creating a positive community atmosphere, promoting trust among members, and the application value of positive SBOCM.

Fifth, we explore the boundary role of OA, finding that OA negatively moderates the impact of PITOC on ACSB, while its impact on other variable relationships is not significant. OA can enhance the negative effect of PITOC on ACSB, possibly because OA reduces individuals' psychological defenses against other community members (Hart, 2014). According to social exchange theory, the reduction of psychological defenses decreases members' expectations of negative returns, making them more willing to share their opinions and feelings based on trust, thus reducing ACSB. Furthermore, although PCTOC itself has a significant negative impact on ACSB, the presence of OA may interfere with this effect. Specifically, OA may lead to uncertainty when members evaluate the community, or other influencing factors (such as personal factors) may become more prominent in an anonymous environment, thus weakening the role of PCTOC. Regarding why OA does not significantly moderate the impact of PITOC and PCTOC on PCSB, we offer the following explanations: (1) OA has a dual effect in online communities. On one hand, it can indeed reduce individuals' psychological pressure and sense of responsibility, potentially amplifying negative behaviors (Gergen et al., 1973; Kim et al., 2023). On the other hand, it can also provide a sense of security, reducing members' concerns when expressing themselves (Luarn and Hsieh, 2014). (2) For PCSB (i.e., silence chosen actively out of altruism and the maintenance of community interests), OA may not significantly change the motivations behind it, as this behavior is inherently positive and beneficial to the community. Such motivations are internal, stable, and less influenced by external factors. Therefore, regardless of the level of OA, members may choose ACSB for the same reasons. (3) The impact of PITOC and PCTOC on PCSB may depend more on community members' personal values and community norms, making the moderating role of OA on PITOC and PCTOC insignificant.

In summary, this study provides an in-depth analysis of the impact of PITOC and PCTOC on SBOCM, as well as the outcome of SBOCM, which not only enriches the application of social exchange theory in online community environments but also offers a new perspective for understanding the dynamics of online communities. This research

finding holds significant theoretical and practical value for comprehending the interactive patterns among members in online communities, optimizing community management, and enhancing online community operation.

6.1. Theoretical implications

First, this study introduces the concept and measurement of SBOCM, as well as its impact on the operation of these communities. This contribution enriches and expands upon traditional theories and literature related to organizational silent behavior. Unlike conventional views of organizational silence, this study posits that the motivations behind SBOCM align more closely with two dimensions: egoism and altruism. Previous literature has acknowledged silent phenomena in online communities, such as lurking (Sun et al., 2014), but has not delved deeper into the underlying motivations. By defining SBOCM from a motivational perspective and rigorously developing a measurement scale that categorizes it into ACSB and PCSB, this research facilitates a more accurate identification and analysis of silence behavior in different contexts. This lays a solid theoretical foundation for future empirical studies.

Second, this study employs social exchange theory to analyze SBOCM, thereby expanding and deepening the application of social exchange theory in the field of online community research. While prior literature has applied sociological theories to the study of online communities, most of this work has focused on the characteristics and positive behaviors within these communities (Zhao and Detlor, 2023; Tep et al., 2022; Zhang and Liu, 2021). However, this research demonstrates that social exchange theory is also applicable for analyzing SBOCM. It highlights the impact of perceived trust on silent behavior and performance, further validating and extending the applicability of social exchange theory within online communities. Additionally, it provides a deeper understanding of the vital role trust plays in the operation of online communities.

Furthermore, this study proposes and validates the moderating effect of online anonymity on the relationship between PTOC and SBOCM, thereby deepening the application scope of online anonymity. Previous studies have focused on the impact of online anonymity on user disclosure behavior (Clark-Gordon et al., 2019) and have revealed that online anonymity can serve as a cover for unethical behavior (Kim et al., 2019). In contrast, our research emphasizes the importance of perceived trust in online community members within the context of online anonymity.

6.2. Practical implications

This study provides important practical guidance for online community operators. The research indicates that PTOC has a significant positive effect on PCSB and a significant negative effect on ACSB. Therefore, online community managers should prioritize the establishment of trust mechanisms to encourage active member participation in online community activities and to reduce the negative silent behaviors stemming from distrust.

Moreover, it is crucial to recognize the comprehensive impact of silent behaviors. Both ACSB and PCSB should be considered, as their effects on OCMP are fundamentally different. PCSB contributes to maintaining community harmony and facilitates effective information dissemination, while ACSB hinders community development. To address ACSB, managers can enhance community engagement by providing increased interaction opportunities, offering attractive content or activities, and reinforcing community culture, thereby creating a space for free expression. On the other hand, for PCSB, it is necessary to establish clear community rules and codes of conduct, implement effective feedback and complaint mechanisms, and foster a trusting atmosphere to diminish harmful verbal conflicts.

Additionally, the findings suggest that ACSB does not serve as a significant mediator between PTOC and OCMP, while PCSB does have a mediating effect. This implies that managers should focus on diversifying motivational factors. In addition to fostering perceived trust, it is important to provide material and honorary incentives that enhance community identity and belonging, thereby stimulating member engagement. Furthermore, OA negatively moderates the relationship between PITOC and ACSB. Managers can judiciously leverage anonymity to lower members' psychological defenses and reduce negative silent behaviors. However, it is important to note that OA does not have a significant impact on the relationships between other variables, suggesting that over-reliance on anonymity for online community management may not be advisable.

In summary, operators should clearly identify the different types of SBOCM and implement targeted measures based on the specific context of the online community to achieve effective management. By diversifying incentive measures and establishing trust mechanisms, online community performance can be improved and the healthy development of the community can be promoted.

6.3. Limitations and future research

Although this study has yielded valuable conclusions in exploring the impact of SBOCM on OCMP from the perspective of trust perception, it still has some limitations. Firstly, the data source of this study may have certain limitations, mainly relying on self-reported and observational data from online community members, which may result in the results being influenced by subjective factors. Future studies could consider employing experimental designs or adopting more objective data collection methods, such as utilizing backend data from online platforms or text mining,

to obtain more comprehensive and objective behavioral data of community members and further understand the formation mechanism and influencing factors of silent behavior.

Secondly, members from different community cultures and social platforms may exhibit diverse silent behavior patterns and motivations, and the sample size of this study may be limited, unable to cover all types of online communities and member characteristics. Future research could conduct cross-cultural and cross-platform comparative studies to analyze member silence behavior across different types of online communities, thereby enhancing the generalizability and accuracy of the findings.

Thirdly, we acknowledge that online communities are complex systems influenced by numerous factors. In this study, we included only the control variables relevant to the research topic, without incorporating deeper internal mechanisms that may influence silent behavior, particularly PCSB, such as moral beliefs, social norms, and a sense of social responsibility. The omission of these factors may have increased the model's residual error to some extent, thereby reducing its explanatory power (model 6 in Table). Therefore, future research could draw upon perspectives from social psychology to investigate the influence of intrinsic cognitive variables on PCSB, considering multi-dimensional control variables, in order to achieve a more comprehensive and nuanced understanding of silent behavior in online environments.

Finally, as online communities continue to grow and develop, the behaviors and interaction patterns of community members are also constantly changing. Future research can further explore the relationship between silent behavior and other community behaviors among online community members, as well as the manifestations and impacts of silent behavior in different types of communities. In addition, theories and methods from multiple disciplines, such as psychology and sociology, can be combined to conduct a more in-depth study on the motivations, antecedents, and consequences of SBOCM.

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