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The role of peer-to-peer interactions in sharing accommodation: From cocreation experience to peer customer engagement

Jing Pang^a, Xiaorong Fu^{b,*}, Yuquan Qi^c

^a School of Business Administration, Shanxi University of Finance and Economics, Taiyuan, China

^b School of Business Administration, Southwestern University of Finance and Economics, Chengdu, China

^c College of Energy and Power Engineering, Changsha University of Science and Technology, Changsha, China



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ABSTRACT

Taking a service-dominant logic, the sharing accommodation business model consists of two forms of value cocreation: experience cocreation during the accommodation service and peer engagement behaviors after its end. Experience cocreation based on peer-to-peer interactions (P2P interactions) is the key to unlocking the competitive advantage of sharing accommodation. However, the understanding of P2P interactions and how they influence peer engagement behaviors is still limited. We systematically deconstruct P2P interactions and explore their impact on peer engagement behaviors using a dataset of 13217 reviews, a correlated topic model analysis method, and a linear mixed-effects model. Our results show that interpersonal interactions (relationship-oriented social interactions and transaction-oriented functional interactions) have a stronger positive effect on peer engagement behaviors than the physical environment. Social interactions and the physical environment have substitution effects on the impact of peer engagement behaviors. Furthermore, offline interactions positively moderate the impact of P2P interpersonal interactions on peer engagement behaviors.

1. Introduction

The sharing accommodation model is based on value co-creation and involves decentralized, self-adjusted actions among cocreators (Zhang et al., 2021). In this business model, value cocreation activities run throughout all stages of an accommodation service transaction (Einav et al., 2016). Taking the view of service-dominant logic, the sharing accommodation model consists of two forms of value cocreation in different service stages: experience co-creation during the service and peer engagement behaviors after the service, and there is an inevitable causal relationship between them. Among them, experience co-creation based on P2P interactions is the key to unlocking the competitive advantage of sharing accommodation (Prebensen et al., 2013; Shuqair et al., 2019). In sharing accommodation settings, peer customers and peer providers have various types of online and offline P2P interactions, which promotes peers' voluntary and discretionary effort to cocreate with other peers that goes beyond fundamental transactions, that is, *peer engagement behaviors* (Zhang et al., 2021). For example, Xiaozhu.com advertises on its official website that it is such a delight to have friends coming from afar. This firm encourages peer customers to cocreate their own unique and personalized experiences through various forms of P2P

interactions, thereby increasing customers' willingness to make voluntary resource contributions to the firm in the future.

Although P2P interactions have received attention in existing literature, the understanding of how they shape experience cocreation and drive peer engagement behaviors remains limited. Existing research has explored the impact of P2P interactions on guest experience and behavioral outcomes (Lu et al., 2020; Moon et al., 2019; Shuqair et al., 2019). However, most of these studies regard P2P interactions as a single-dimensional variable, and lack empirical evidence on the effect of different P2P interaction types (please see [supplementary material](#) for a review of relevant literature). Some studies focus on P2P interactions to establish social relations or only on P2P interactions based on service-related information exchanges, and some studies mix different types of interaction into one concept. Ignoring this issue may lead to an underestimation of the impact of P2P interpersonal interactions in sharing accommodation settings, especially the role of relationship-oriented social interactions in improving peer customer engagement behaviors. It also hinders platform firms from providing effective management strategies for uncontrollable P2P interactions and promoting the value creation of all users. Hence, we endeavor to extend this line of inquiry by systematically deconstructing P2P interactions

* Correspondence to: Southwestern University of Finance and Economics, 555 Liutai Avenue, Wenjiang District, Chengdu, China.

E-mail addresses: fuxr@swufe.edu.cn, fu_xrong@126.com (X. Fu).

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and exploring their impact on customer follow-up behavior.

As the foundation of experience cocreation processes, P2P interactions typically involve interactions between peer customers and a variety of interaction elements (Kapoor et al., 2021). On the one hand, P2P interactions involve the direct interaction between peer customers and peer service providers, that is, P2P interpersonal interactions. In an environment with high anonymity and information asymmetry, peers establish rapport and dyadic trust through interpersonal interaction (Moon et al., 2019). We distinguish two types of P2P interpersonal interactions, relationship-oriented social interactions and transaction-oriented functional interactions, based on the different roles played by peer providers (Homburg et al., 2011). In social interactions, service providers play the role of friends to satisfy the peer customer's social motivations, while in functional interactions, service providers play the traditional role of businesspeople to satisfy the customer service needs (Heide and Wathne, 2006). Interpersonal interactions with distinct customer orientations bring peer consumers different perceptions of relationships and thus may have different effects on their follow-up value cocreation behavior (Homburg et al., 2011; Miao and Wang, 2016).

On the other hand, P2P interactions also involve indirect interactions between peer customers and experience environments that peer providers facilitate, that is, the physical environment provided by peer providers. P2P accommodation services are provided by private rather than commercial organizations (Lu et al., 2020); hence, peer providers are not just renting out a physical space but a place in which they have made a significant emotional investment (Zhu et al., 2019). The physical environment reflects peer providers' aesthetics and life attitudes (Modly et al., 2017); that is, peer providers interact with peer customers indirectly through the physical environment, which impacts peer customers' cocreated experience. Therefore, interpersonal interactions and physical environments jointly shape peer customers' personalized and contextualized experience cocreation (Pralhad and Ramaswamy, 2004), and it is worth noting that various P2P interactions may have different roles in shaping cocreated experience and hence different effects on peer engagement behaviors (Heo, 2016).

We attempt to systematically deconstruct P2P interaction and explore the causal relationship between experience co-creation and peer engagement behaviors in sharing accommodation. Specifically, the current study explores the following questions: (1) Do P2P interpersonal interactions and physical environments affect peer customer engagement behavior? What are the differences in these impacts? (2) From the perspective of customer orientation, are there differences in the impact of relationship-oriented social interactions and transaction-oriented functional interactions on peer customer engagement behavior? (3) What factors moderate the impact of P2P interaction on peer engagement behaviors? To address the above questions, we collected the text data of 13217 customer reviews from a sharing accommodation platform and identified 15 salient themes using the related topic model method (CTM, (Blei and Lafferty, 2007)). Furthermore, we constructed a multidimensional measure of P2P interactions based on these key themes and used a linear mixed-effects model to examine the relationship between P2P interactions and peer customer engagement behavior. We then demonstrate the robustness of the results with three additional tests.

This study contributes to the literature in four ways: first, we explore the causal relationship between the experience co-creation and peer engagement behaviors, expanding the current value cocreation theory. Second, we contribute to the literature by systematically deconstructing the multiple dimensions of P2P interactions. We found that P2P social interactions have a pivotal positive influence on peer customer engagement. Thirdly, we focus on the uniqueness of peer engagement behaviors on sharing accommodation platforms, which is an extension of customer engagement theory. Finally, this study provides a methodological contribution that addresses how to use unstructured text to analyze P2P interactions based on CTM.

2. Theoretical background

2.1. Peer engagement behavior

The early research on engagement originated from the significant changes in the relationship between customers and firms during the past decades (Hennig-Thurau et al., 2010). The balance of power is transitioning from firms to customers, and the relationship model shifts from firms-dominated to customer-dominated (Deighton and Kornfeld, 2009). Within the context of customer-centricity, firms actively encourage customer engagement behavior, defined as customers' voluntary and autonomous resource contributions beyond economic transactions (Hollebeek et al., 2014). Consumer engagement behaviors are suggested as activities in which customers make direct or indirect resource contributions that have a brand or firm focus, such as buying, referring, sharing and giving feedback (van Doorn et al., 2010; Harmeling et al., 2017; Kumar and Pansari, 2016; Pansari and Kumar, 2017; Verleye et al., 2014). These behaviors contribute to building customer-firm connections, ultimately improving firm performance such as sales growth, competitiveness and profitability. (Brodie et al., 2013; Davey et al., 2022; Vivek et al., 2012; Islam and Rahman, 2016; Islam et al., 2019). However, despite the extensive interest in customer engagement, current research primarily focuses on the binary relationship between firms and customers. It fails to consider the unique characteristics of P2P accommodation platforms (Brodie et al., 2019).

In the P2P accommodation context, the peers' consumption needs are fulfilled by autonomous service providers, whereas platforms only provide institutional support for service exchange activities (Einav et al., 2016). Hence, customer engagement in the traditional economic context has evolved into peer engagement within the P2P business context. The collaboration and interaction among multiple actors jointly influence peer customers' cognition, emotion, and behavior, thereby motivating their subsequent engagement behavior (Lin et al., 2022). Peer engagement is a multidimensional construct that includes cognitive, emotional, and behavioral components, such as customer engagement (Brodie et al., 2011; Hollebeek et al., 2014). Peer engagement behavior focuses on the behavioral dimensions of peer engagement. The current paper cites the definition of peer engagement behaviors proposed by (Lin et al., 2019a, 2019b): peer engagement behaviors is the voluntary and discretionary effort of peers to interact and co-create with other peers in a peer environment. We attempt to explore the causal relationship between experience co-creation and peer engagement behaviors in the context of P2P accommodation and explore the driving factors of peer engagement behaviors from the perspective of P2P interaction.

2.2. Cocreation experience and peer engagement behaviors in P2P accommodation

In line with the service-dominant logic, value is cocreated in interactions through resource integration (Lusch and Vargo, 2006; Vargo and Lusch, 2004; Vargo and Lusch, 2008). Actors can integrate a range of resources beyond goods and money (Michel et al., 2008). Peer customer engagement behaviors focus on the resources provided by peer customers, e.g., network assets, persuasion capital, knowledge stores, and creativity. Thus, peer customers contribute an extensive variety of resources through engagement behaviors, thereby influencing the value cocreation process (Rather et al., 2022). P2P accommodation is naturally associated with value cocreation, given its focus on sharing goods/services (Belk, 2014). In this context, value is always cocreated, jointly and reciprocally, in interactions among peer customers, peer providers and firms through the integration of resources (Pralhad and Ramaswamy, 2004). Such a cocreation experience describes peer customers' psychological states during active participation and individualized interactions with peer providers and the environment that the peer providers facilitate (Leclercq et al., 2016).

Taking a service-dominant logic, experience cocreation and peer

customer engagement behavior are diverse forms of value cocreation in different service stages. Typically, a P2P transaction comprises three stages: connection, encounter and separation. In the connection stage, peer customers and peer providers interact through the technology-mediated online platform. In the encounter stage, service contact is transferred from virtual space to physical space. During the connection and encounter stages, peers complete service delivery after various forms of interpersonal interactions and physical environments and then co-construct their unique experiences. In the service separation stage, peer customers contribute their resources (peer engagement behaviors) to value cocreation based on previous cocreation experiences. Therefore, the value cocreation in the P2P model includes the experience cocreation in the service connection and encounter stages and the resource contribution in the service separation stage. We attempt to analyze the causality between experience cocreation and engagement behaviors after the P2P accommodation service ends.

2.3. Peer-to-peer interactions in P2P accommodation

Sharing accommodation refers to a process whereby property owners rent out their rooms to others for a short period (Pappas, 2019). With the rapid growth of P2P accommodation and its significant impact, P2P interactions (i.e., peer customer-to-peer provider interactions) in the context of P2P accommodation has become the focus of research (Lin et al., 2019; Lin et al., 2019). Active and open interactions enable a peer customer to cocreate personalized and memorable experiences, subsequently impacting the customer's positive behavioral intentions (Taheri et al., 2018). Through P2P interaction, guests can become familiar with local culture, learn about accommodation services, receive tourism information, and solve problems (Lin et al., 2019; Lin et al., 2019). The interaction between peers can also be for social purposes, such as when the hosts invite the guests to participate in entertainment and share life experiences (Carneiro et al., 2018).

It is critical to evaluate, deconstruct and synthesize P2P interactions for the following reasons (Shuqair et al., 2019). First, P2P interactions are pivotal to reducing peer customers' perceived risk and enhancing dyadic trust between peers (Moon et al., 2019). Second, peer customers' experience with P2P accommodation depends on the discretionary behavior of peer providers (Lu et al., 2020), and such discretionary behaviors that are not controlled by platforms (reflected in P2P interactions) affect customers' evaluations of their experience (Moon et al., 2019). Cocreation experience is formed in P2P accommodations by fostering individualized interactions and creating an experience environment within which peer consumers can create their own unique personalized experiences (Pralhad and Ramaswamy, 2004). Thus, based on diverse interaction elements (Chen et al., 2013; Liu et al., 2021; Walls, 2013), we deconstruct P2P interactions into direct interpersonal interactions and physical environments. Furthermore, we divide interpersonal interactions into relationship-oriented social interactions and transaction-oriented functional interactions, in line with prior research on customer orientation (Homburg et al., 2011) (see Fig. 1).

2.3.1. Social interactions based on relational orientation

Social interactions refer to interactions aimed at building interpersonal relationships and satisfying the emotional needs of peer customers (Köhler et al., 2011). Social interactions are not directly associated with the accomplishment of specific service tasks. Compared with the traditional hotel industry, P2P accommodation is unique in that it promises to provide closer interactions with locals and create authentic experiences (Lu et al., 2020). Peer customers show higher social motivation and expect greater "social benefits" from personal peer providers through P2P interactions (Shuqair et al., 2021). Peer customers desire human connections that are afforded through P2P interactions, which is one of the most critical factors for customers to choose P2P accommodation rather than traditional hotel lodging (Cheng and Foley, 2018).

In these settings, the interactions between the host and the customer

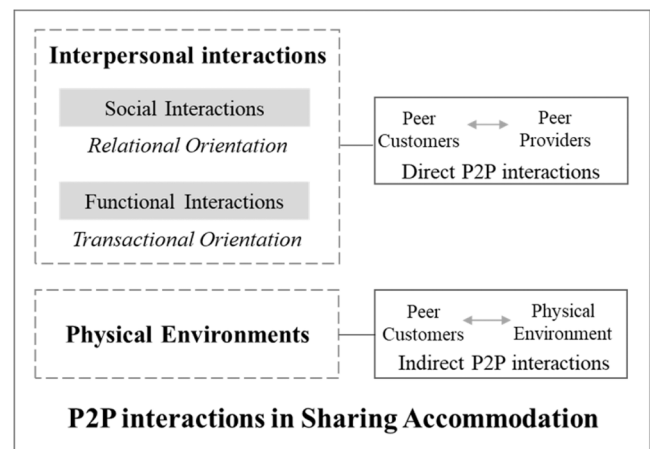


Fig. 1. P2P interaction in experience cocreation.

are not only for delivering service information but also to satisfy the customer's social interaction motivation (Cheng and Foley, 2018; Ye et al., 2019). Many hosts also employ various ways to give customers a sense of belonging and a feeling of being at home (Taheri et al., 2018). They may share their lifestyles and private living space with each other, forming a strong personal emotional bond (Cheng, 2016). In addition, P2P interactions are based on the principle of reciprocity (Lin et al., 2019; Lin et al., 2019), i.e., a two-sided review, which provides an equal relationship basis for social interactions between the two sides.

2.3.2. Functional interactions based on transactional orientation

Functional interactions refer to interactions where both parties focus on completing specific transaction tasks, hoping to reduce costs and achieve expected transaction goals (Köhler et al., 2011). Functional interactions are related to the skills and knowledge needed to complete service transaction tasks and emphasize fulfilling responsibilities and task efficiency (Köhler et al., 2011). Through frequent communication and information exchange activities, P2P functional interactions help to improve the trust of peer customers, establish mutually beneficial relationships with them, and finally improve customer loyalty, such as reuse intention and positive WOM (Wu et al., 2017).

2.3.3. Physical environments

The physical environment describes the physical settings/conditions controlled by service providers, which can shape customers' experience and behavior. The physical environment is a prominent factor in shaping customers' experience during their stay, as these clues reveal information related to products and services (Walls, 2013). Physical environments involve ambiance, multisensory, space and function, and signs/symbols/artifacts (Liu et al., 2021). Environmental cues of accommodations, such as a photo wall showing the host's life story, strongly influence customers' perceptions and attitudes (Dedeoglu et al., 2018). Research in the marketing field has also pointed out that the physical environment of the service setting contributes to the achievement of organizational and marketing goals (Berry et al., 2006). In P2P accommodations, the environment provided by peer providers to customers is diverse, non-standardized, and reflects local cultural authenticity (Liu et al., 2021). The environment conveys the provider's aesthetics, life attitude, and efforts to meet the peer customers' needs (Walls, 2013); thus, physical environments are also a type of indirect interactions between peer providers and peer customers.

2.3.4. Offline interactions

Offline interactions refer to the P2P face-to-face interaction when they share the peer providers' house or room (Wu et al., 2021). P2P interactions can only occur on technology-mediated platforms or in

face-to-face offline settings. For example, social interactions may occur online, such as peer providers sharing local culture with peer customers, or they may exist offline, such as peer providers providing complimentary breakfast for peer customers. Different interaction channels can affect consumers' emotional experience and subsequent behavior (Baker et al., 2016; Moon et al., 2019; Wu et al., 2017). Therefore, the current paper tries to explore the moderating effect of offline interaction (without offline interaction) on the relationship between P2P interaction and peer engagement behaviors.

2.4. Hypotheses development

P2P interactions help build a satisfying relationship and form psychological or emotional bonding, ultimately enhancing customer engagement behavior, that is, a customer's voluntary resource contribution to a firm's marketing function, going beyond the economic transaction (Harmeling et al., 2017) Peer customer engagement behaviors in P2P accommodation contexts refer to a peer customer's voluntary and discretionary effort towards other actors (i.e., platform firms or peer providers) (Lin et al., 2019; Lin et al., 2019). Compared with the traditional hotel industry, the operational performance of the P2P accommodation is more dependent on peer customer engagement behavior (Lin et al., 2019; Lin et al., 2019). On the one hand, the reputation mechanism of P2P accommodation platforms relies on positive comments and effective feedback from customers; on the other hand, peer customer engagement behaviors enhance the two-sided network effect of P2P accommodation platforms, helping to attract more high-quality peer providers and peer customers (Oh et al., 2015). Peer customers form their own unique cocreation experiences based on the artifacts and environments provided by the firms or service providers when they obtain the products/services (Carù and Cova, 2003). These cocreation experiences ultimately influence their direct or indirect resource contributions, such as repurchases, referrals, and feedback (Pansari and Kumar, 2017) (see Fig. 2).

2.4.1. The relationship between sociation interactions and peer engagement behaviors

Relationship-oriented social interactions in P2P accommodation focuses on the establishment of interpersonal relationships and the satisfaction of the emotional needs of peer customers, which helps to build strong social bonds among peers and increases the subsequent reciprocal behavior of peer customers (Homburg et al., 2011). The social exchange theory suggests that interpersonal transactions follow the principle of reciprocity, whereby an action by one party leads to a response by another (Cropanzano and Mitchell, 2005). Social interactions imply a higher level of interpersonal involvement that makes peer customers perceive the sincerity of the provider and the importance the provider attaches to themselves (Tidwell and Walther, 2002). Consequently, under the guidance of reciprocity rules, peer customers are more likely to have voluntary resource contribution behavior.

In addition, a key driver of customer engagement in sharing accommodation is social motivation (Cheng and Foley, 2018; Lu et al.,

2020; Milanova and Maas, 2017; Guttentag et al., 2018). Peer customers tend to gain a more authentic experience or make new friends through interaction with the provider (Farmaki and Stergiou, 2019); (Shuqair et al., 2021). Relationship-oriented social interactions, such as sharing local culture and cuisine, satisfy peer customers' social motivations (Pera et al., 2019), increasing their satisfaction and positive emotions.

Furthermore, although the social interactions in P2P accommodation may not be directly related to the service information, when the service provider presents more social cues in an interaction, the peer customer may feel at ease (Köhler et al., 2011). In an enjoyable service atmosphere, peer customers' acceptance of service-related knowledge will increase (Ashforth et al., 2007), which promotes peer customers' positive evaluation of the service experience (Wang et al., 2007). Hence, we hypothesize that:

H1. P2P social interactions have a positive effect on peer customer engagement behavior.

2.4.2. The relationship between functional interactions and peer engagement behaviors

Functional interactions enable peer providers to accurately identify peer customers' needs (Keeling et al., 2010) and provide optimal service solutions (Yang et al., 2019). Hence, functional interactions contribute to improving peer customers' comprehensive evaluation of services, increasing their positive word-of-mouth (Roongruangsee et al., 2021). Personalized service experience is a core prerequisite for achieving value cocreation (Pappas, 2019). The P2P functional interactions focus on the core needs of the peer customers, providing them with personalized service experiences, which also helps to motivate their positive willingness to contribute resources.

In addition, functional interactions are directly related to service content, emphasizing task-specific information transmission (Homburg et al., 2011; van Dolen et al., 2007). Based on self-determination theory, the fulfillment of psychological needs will stimulate the intrinsic motivation of individual actions (Deci and Ryan, 2012). Functional interactions improve customer knowledge and satisfy their perceived competence and autonomy, which in turn enhances peer customers' intrinsic motivation to contribute resources.

Furthermore, research on buyer-seller interactions has also shown that product-related knowledge and skills exhibited by service providers in functional interactions can improve customer recognition of service providers, improving their purchase intention (Homburg et al., 2011). Therefore, we propose the following:

H2. P2P functional interactions have a positive impact on peer customer engagement behavior.

2.4.3. The relationship between physical environments and peer engagement behaviors

Peer customers need to interact not only with peer providers but also with the physical environment in which the service is provided. Environmental factors in the service process are closely related to the cognitive evaluation of peer customers (Ye et al., 2019). In some cases, the physical environment even has a greater impact on customer purchasing decisions than the product/service itself (Walls, 2013). Existing research has demonstrated the importance of tangible elements in service settings and pointed out that the physical environment can influence customers' emotional and cognitive evaluations and subsequent behavioral intentions (Dedeoglu et al., 2018; Walls, 2013).

P2P accommodation provides a large number of non-standardized and personalized listings (Jiang et al., 2020). Peer providers convey their aesthetics, lifestyle and values through the design of their rooms and generate strong empathy from peer customers, affecting their emotions and subsequent behavioral responses (Shuqair et al., 2021). Furthermore, the unique advantage of P2P accommodation is its promise to provide customers with authentic cultural experiences, such as public space landscapes and products with local cultural

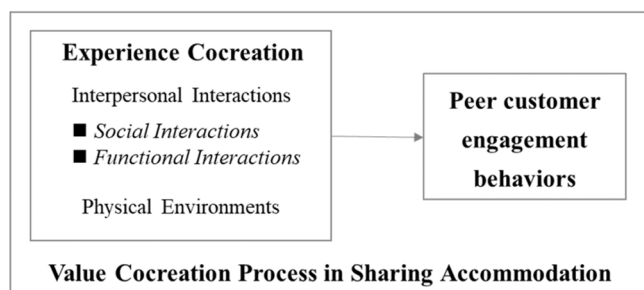


Fig. 2. Value cocreation process in sharing accommodation.

characteristics (Mody et al., 2017), which in turn increases customers' evaluation of their experience. Therefore, we propose the following:

H3. The P2P physical environment has a positive impact on peer customer engagement behavior.

2.4.4. *The moderation effect of social interactions*

Customer experience depends on a holistic evaluation of the service/product (Zeithaml, 1988; Zeithaml, 1988). We further suggest a substitution effect between P2P social interactions and physical environments; that is, P2P social interactions can redress the possible shortcomings of the environment to a certain extent.

P2P social interactions are more like interpersonal communication between friends or acquaintances. P2P social interactions are more like interpersonal communication between friends or acquaintances. Based on role theory, when customers regard service providers as friends, they typically have a more favorable evaluation of the product/service itself (Grayson, 2007; Heide and Wathne, 2006). Moreover, people's higher tolerance for friends also increases their tolerance for product/service deficiencies provided by service providers that they perceive as friends (Ho, 2012). Therefore, even when the physical environment facilitated by service providers is insufficient, customers participating in social interactions may still generate positive service evaluations.

Social interactions mean a higher degree of individual participation, showing that peer providers value their relationships with customers (Roschk and Gelbrich, 2017). Thus, peer customers gain more emotional or hedonic value, making up for the reduction in utilitarian values due to the deficiencies of products/services. In addition, since social interactions with locals serve as a key driver of customers participating in P2P accommodation, peers tend to give higher weight to social factors in P2P transactions when evaluating the service experience (Barnes and Mattsson, 2016), which weakens the impact of the physical environment on customer follow-up behavior, suggesting a negative moderation effect or a substitution effect.

In contrast to social interactions, transaction-oriented functional interactions are thought to be profit-driven, involving formalized, standardized communication. Thus, it is difficult for peer customers to build emotional connections with peer providers and have empathic responses (Sparks et al., 2016). Additionally, service providers cannot provide customers with more social value through functional interactions. Hence, P2P functional interactions cannot replace the role of physical environments to a certain extent, such as through social interactions. Thus, we propose the following:

H4. The effect of physical environments on peer customer engagement behavior will be negatively moderated by P2P social interactions.

2.4.5. *The moderation effect on offline interactions*

Human interactions in P2P accommodation are divided into online interactions and offline interactions; the former are supported by technology-mediated platforms, and the latter are realized through face-to-face interactions (Wu et al., 2021). Offline interaction refers to the P2P face-to-face interaction when they share the peer providers' house or room (Wu et al., 2021). The media richness theory assumes that information dissemination in offline channels is synchronous, thus providing more accurate and specific information than online channels (Lovett et al., 2013). In addition, the atmosphere cues in the offline environment enhance the vividness and authenticity of the presented information (Fu and Ren, 2023). Hence, offline interactions between peers increase the effectiveness of information (Baker et al., 2016), helping service providers meet customers' personalized needs more accurately and efficiently through functional interactions, subsequently strengthening the impact of functional interactions on peer customers' subsequent resource contributions.

One crucial factor that attracts individuals to participate in P2P commercial transactions is the social interactions among peers. Face-to-face interactions with other peers (e.g., service providers) may satisfy

peer customers 'emotional/hedonic motives for engaging in P2P accommodation, such as 'making new friends' (Wu et al., 2017), thereby increasing the positive impact of social interactions on customer engagement behavior. In addition, in many P2P industries, the presence of service providers is the key to building customer experience. For example, in the P2P accommodation industry, the face-to-face interaction between hosts and guests is the core factor affecting customer satisfaction, word-of-mouth, and repurchase intention (Moon et al., 2019). Therefore, we propose the following:

H5. P2P offline interactions can strengthen the positive impact of (a) P2P social interactions and (b) P2P functional interactions on peer engagement behaviors.

3. Methods

3.1. Data collection

To explore how P2P interactions affect peer engagement behaviors, we collected data from Xiaozhu.com, a leading Chinese online accommodation-sharing platform. We used Xiaozhu.com to collect data for three reasons. First, Xiao.com is one of the largest online accommodation-sharing platforms in China, and its market share has increased rapidly in recent years. Second, we can obtain massive user-generated content data and other information related to the properties of listings. Finally, Xiao.com encourages the interaction between service providers and customers and provides many opportunities for their interaction. We used Python to extract data from six cities: Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu and Xiamen. These cities are the most economically developed cities and the most popular tourist cities in China. The sample includes 5805 listings and 13217 user reviews from January 2017 to March 2021. We removed samples with missing information and retained 11206 customer reviews, see Table 1. In addition to customer comments, we also collected information about the attributes of listings (such as price, overall ratings) and customers' information (date of stay).

3.2. Data analysis

Users often mention their experience of specific accommodation services in online reviews, including direct and indirect P2P interactions and their subsequent purchase and recommendation intentions (peer engagement behaviors). Thus, we capture relevant topics from user reviews to determine metrics for P2P interactions and peer engagement behaviors using a topic modeling technique, the correlated topic model (CTM) (Blei and Lafferty, 2007). The CTM topic model can convert the unstructured review information into quantitative information and deeply mine the reviews' potential semantic information. The CTM topic model introduces a multinomial distribution instead of a Dirichlet

Table 1
Samples profile.

Item	Frequent	Percent
City	Listings (reviews)	
Beijing	541 (1886)	16.83% (16.43%)
BShanghai	545 (1916)	17.10% (16.56%)
BShenzhen	455 (1537)	13.72% (13.82%)
BGuangzhou	635 (2193)	19.57% (19.29%)
BChengdu	650 (2241)	20.00% (19.74%)
BXiamen	466 (1433)	12.79% (14.16%)
Property type		
Bentire house	2552 (8412)	77.52% (75.07%)
Bshared room	740 (2794)	22.48% (24.93%)
Max occupancy for the property		
B<3	1024 (3561)	31.11% (31.78%)
B3-6	1610 (5233)	48.91% (46.70%)
B>6	658 (2512)	19.99% (21.52%)

distribution in LDA to extract the hidden topics in a document set and introduces a covariance matrix to describe the correlation between topics, which solves the problem of noncorrelation between topics extracted by the LDA topic model.

To apply the CTM, we preprocessed the review data by word segmentation, removing stop words, removing sparse words and feature processing using the R language, which produces a preprocessed document-term matrix (see Fig. 3 for procedures of topic prediction). All these steps were carried out in Chinese language. We refer to a user review as a “document” and the set of reviews as a “corpus”. Assume this corpus contains M documents and N different feature terms. Let W_d denote the N_d dimensional vector composed of all N_d feature words in document d; $W_{d,n}$ represents the nth feature word in the dth document; K represents the number of topics. The CTM of each document in the corpus can be described as the following generative process:

1. Draw $\eta_d | \{\mu, \Sigma\} \sim N(\mu, \Sigma)$
2. For $n \in \{1, \dots, N_d\}$
 - a. Draw topic assignment $Z_{d,n} | \eta_d$ from Mult ($f(\eta_d)$).
 - b. Draw word $W_{d,n} | \{Z_{d,n}, \beta_{1,K}\}$ from Mult ($\beta_{Z_{d,n}}$),

where $f(\eta_d)$ maps a natural parameterization of $\eta = (\eta_1, \dots, \eta_k)$ to the vector of topic probabilities $\theta = (\theta_1, \dots, \theta_k)$ expressed as:

$$\theta = (f(\eta)) = \frac{\exp\{\eta\}}{\sum_i \exp\{\eta_i\}}$$

CTM requires a fixed number of topics, K, a hyperparameter that must be determined before model operation (Blundell et al., 2009). We calculated topics’ perplexity, coherence and frequency to comprehensively identify the optimal number of topics according to these three indicators. These indicators describe the accuracy of the topic model’s prediction. Low perplexity, high coherence and low frequency indicate high generalization performance (Blei et al., 2003) (see Fig. 4).

We found that the optimal number of topics for user comments was k = 15; then, we used the representative words of each topic to name all topics. The fifteen topics are “repurchase intentions”, “satisfaction”, “favorable comment”, “recommendation”, “room facilities”, “convenience”, “comfort”, “home feeling”, “enjoyment and pleasure”, “friendliness”, “warmth and caring”, “helpfulness”, “problem solving”, “hospitality”, and “satisfying demands”; see Table 2.

3.3. Model specification

According to the literature and topic model operation results (Liu et al., 2021), we merged and classified the fifteen topics into four dimensions: social interactions, functional interactions, physical environments and peer engagement behaviors. As a data-reduction technology, CTM enables us to combine different topics with default probability using standard econometric methods. Specifically, we use the CTM probability of each topic appearing in the reviews and other listing-related indicators to set up an analysis model to explore the impact of P2P interactions on peer engagement behaviors. Table 3 shows the definitions of the variables included in the model.

3.3.1. Dependent variable

According to the definition of peer engagement behaviors, we use the topics “repurchase intentions”, “satisfaction”, “favorable comment”, and “recommendation” to describe peer engagement behaviors. We add the CTM probabilities of these topics in each review and multiply it by the text length of this review to measure the peer engagement behaviors of the user who generated this review.

3.3.2. Independent variables

Social interactions. In social interactions, service providers pay attention to each other’s emotional needs and hope to establish close relationships with service demanders. Thus, we use the topics “home feeling”, “enjoyment and pleasure”, “friendliness”, and “warmth and caring” to describe social interactions. We add up the CTM probabilities of these topics in each review and multiply it by the text length of this review to measure the social interactions of the user who generated this review.

Functional interactions. Functional interactions are goal oriented. Service providers focus on transaction-related tasks and hope to meet users’ service needs effectively. Thus, we use the topics “helpfulness”, “problem solving”, “hospitality”, and “satisfying demands” to describe functional interaction. We add up the CTM probabilities of these topics in each review and multiply it by the text length of this review to measure the functional interactions of the user who generated this review.

Physical environments. Physical environments refer to the products or physical space provided by service providers. Hence, we use the topics “room facilities”, “convenience”, and “comfort” to describe the physical

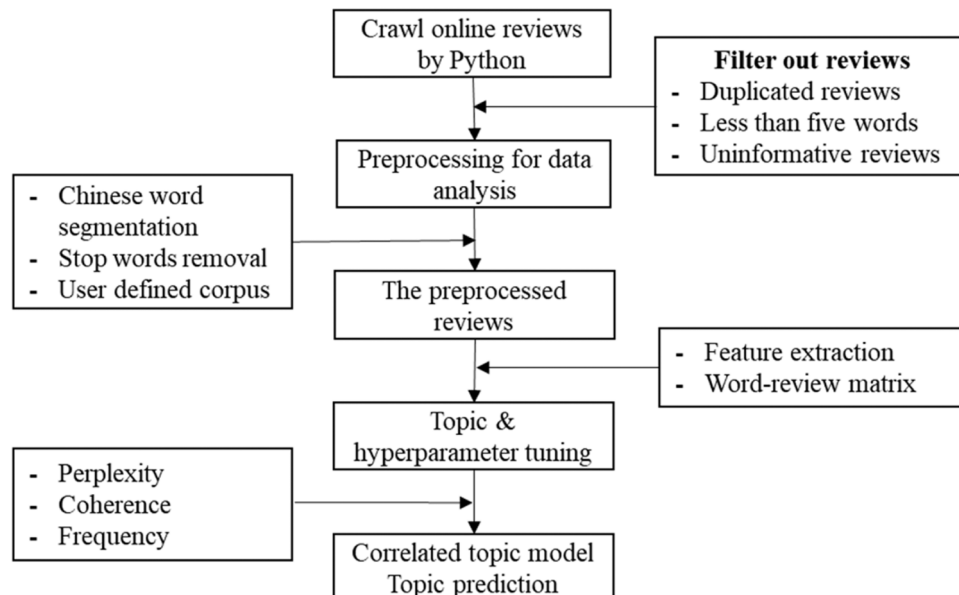
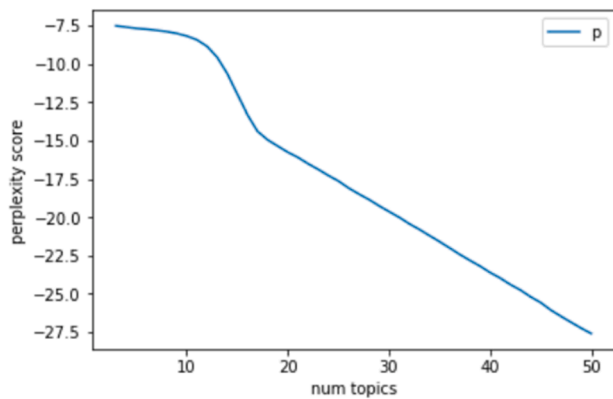
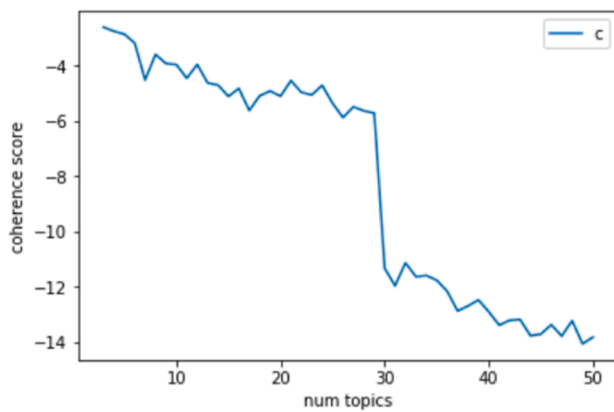


Fig. 3. The process of topic prediction based CTM.

a. perplexity



b. coherence



c. frequency

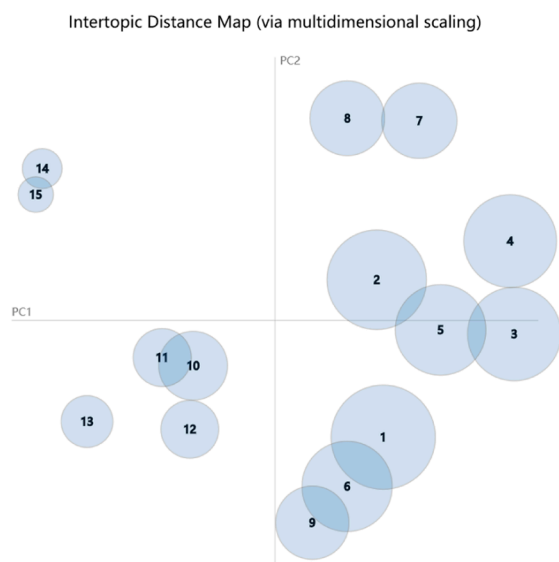


Fig. 4. Selecting the number of topics based on perplexity, coherence and frequency a. perplexity. b. coherence. c. frequency.

environment. We add up the CTM probabilities of these topics in each review and multiply it by the text length of this review to measure the physical environments of the user who generated this review.

Offline interactions. Consistent with previous studies, we use the binary variable of house types to measure whether there are offline interactions between guests and hosts (Wu et al., 2021). This variable was

Table 2

Topics extracted from online customer reviews.

Dimensions	Topics	Feature words
Social interaction	home feeling	home feeling, people, home, warm, nice
	enjoyment and pleasure	play, happy, we together, nice host, yard
	friendliness	friendliness, nice person, enthusiastic, special, great
	caring	caring, kind, intimate, loving, very nice
Functional interaction	helpfulness	helpful, answer, patient, service, positive
	problem solving	solve, timely, feedback, reply, host
	hospitality	check out, service, communication, introduce, solution
Physical environment	satisfy demand	satisfy, need, like, host, special
	room facilities	room, clean, facilities, great, transportation
	convenience	convince, downstairs, eating, location, room
Peer engagement behavior	comfort	comfortable, room, bed, sleeping, big
	repurchase intentions	next time, come back, again, chance
	satisfaction	satisfaction, perfect, great, experience, highly
	favorable comment	favorable comment, pretty good, five stars, likes, the second time
recommendation	recommend, every time, nice, choose, excellent	

Table 3

Variable definitions.

Variable Name	Definition
Peer Engagement Behavior	A peer's voluntary and discretionary effort to interact and/or cocreate with other peers in a peer-to-peer context that goes beyond fundamental transactions and has a peer focus.
Social Interactions	Social interactions refer to interactions aimed at building interpersonal relationships and satisfying the emotional needs of peer customers, without direct correlation to completing specific service tasks.
Functional Interactions	Functional interactions refer to the interactions where both parties focus on completing specific transaction tasks, hoping to reduce costs and achieve expected transaction goals.
Physical Environment	Physical Environment describes the physical settings/conditions controlled by service providers, which can shape customers' experience and behavior.
Offline Interactions	Offline interactions refer to the P2P face-to-face interaction when they share the peer providers' house or room.
Clean	The rating of cleanliness of a listing.
Description	The rating for how well the online description of a listing matches the real situation.
Location	The rating of the location of a listing.
Safety	The rating of the security of a listing.
Cost performance	The rating of value for money of a listing.
Price	The price of a listing.
Year	The year that the peer customer ordered the listing.
Comment Volume	The total number of reviews of a listing.

coded as 0 if the accommodation type is "Entire place" (a place all to yourself) since there are typically no offline interactions between guests and hosts due to the ubiquitous self-service check-in technology and was coded as 1 if the guest chooses "Shared room" (your own room with some shared common spaces).

3.3.3. Control Variables

Regarding control variables, prior research has shown that the listing characteristics displayed on online platforms play an essential role in affecting customer experience (Liu et al., 2021). We include cleanliness, description, location, safety, and cost performance as the control variable, which reflects one customer's evaluation of the listing (Biswas

et al., 2020). We also add price to the model as a signal of product quality and cost because price significantly affects customer attitude and behavior (Lin et al., 2019; Lin et al., 2019). Besides, we include the volume of comments in the model since it can reflect the host's popularity and past order volume to a certain extent, which is essential for building customers' overall evaluation in P2P accommodations (Wu et al., 2021). In addition, the temporal period we are examining includes the period before and after the outbreak of COVID-19. Based on existing literature, COVID-19 could affect customers' overall accommodation experience and behaviors (Kim et al., 2023; Kim and Han, 2022; Shin and Kang, 2020; Xiang et al., 2022; Ye et al., 2023). Customer reviews before December 31, 2019 (taking into account that the epidemic has not broken out at this stage and the public has not yet realized the seriousness of COVID-19) are pre-COVID-19, codes as 0; customer reviews from January 2020 are post-COVID-19, coded as 1. Table 4 shows the descriptive statistics of the variables included in the model.

3.3.4. Model of peer engagement

Because we use multilevel data (city, list, customer) and want to include random effects to account for both customer and city heterogeneity, we use a mixed-effects linear model for model analysis:

$$\begin{aligned}
 &Peer\ Engagement\ Behavior_{u,h,r} \\
 &= \alpha_0 + \alpha_{1,c} + \alpha_{2,h} + \alpha_3 Social\ Interaction_{u,h,r} + \alpha_4 Functional\ Interaction_{u,h,r} \\
 &+ \alpha_5 Physical\ Environment_{u,h,r} + \alpha_6 OFFline\ Interaction_h \\
 &+ \alpha_7 Physical\ Environment_{u,h,r} \times Social\ Interaction_{u,h,r} \\
 &+ \alpha_8 Physical\ Environment_{u,h,r} \times Functional\ Interaction_{u,h,r} \\
 &+ \alpha_9 OFFline\ Interaction_h \times Social\ Interaction_{u,h,r} \\
 &+ \alpha_{10} OFFline\ Interaction_h \times Functional\ Interaction_{u,h,r} \\
 &+ \alpha_{11} Clean_h + \alpha_{12} Description_h + \alpha_{13} Location_h + \alpha_{14} Safety_h \\
 &+ \alpha_{15} Costperformance_h + \alpha_{16} Price_h + \alpha_{17} Year_h + \alpha_{18} Comment\ Volume_h
 \end{aligned}$$

Table 4
Descriptive Statistics.

Variable Name	Mean	Min	Max	SD	SE	95%,CI		Skewness	Kurtosis
						Lower	Upper		
Peer Engagement Behavior	17.66	0.49	347.43	19.54	0.18	17.30	18.02	21.09	3.16
Social Interaction	14.29	0.37	465.30	17.72	0.17	13.97	14.62	66.19	5.10
Functional Interaction	24.21	0.61	584.90	33.58	0.32	23.59	24.83	28.21	3.81
Physical Environment	26.10	0.37	1027.54	32.52	0.31	25.50	26.70	92.92	5.27
Offline Interaction	0.10	0.00	1.00	0.30	0.0028	0.09	0.11	5.354	2.71
Clean	4.30	1.60	5.00	0.39	0.0036	4.29	4.30	0.93	-0.35
Description	4.24	1.60	5.00	0.31	0.0029	4.23	4.25	0.23	-0.23
Location	4.24	1.60	5.00	0.42	0.0040	4.23	4.25	0.17	-0.26
Safety	4.20	1.60	5.00	0.34	0.0032	4.19	4.21	-0.22	-0.21
Cost performance	4.19	1.60	5.00	0.46	0.0043	4.19	4.20	-0.25	-0.18
Price	649.54	35.00	12,000.00	846.92	8.00	633.86	665.22	41.47	5.15
Year	0.28	0.00	1.00	0.45	0.00	0.27	0.29	-1.02	0.99
Comment Volume	173.41	4.00	2389.00	224.96	2.13	169.25	177.58	16.20	3.24

$$+ \varepsilon_{u,h,r}$$

where Peer Engagement Behavior_{u,h,r} denotes the peer engagement behaviors for user u, expressed in review r for listing h; $\alpha_{1,c}$ and $\alpha_{2,h}$ represent the user and listing random elements, respectively; and $\varepsilon_{u,h,r}$ is the error term. We interact social interactions and functional interactions with the physical environment and interact social interactions and functional interactions with offline interactions. The correlation matrix of all variables is shown in Table 5.

4. Results

4.1. Main findings

We begin with a multilevel mixed-effects linear regression of the model of peer engagement behaviors without the interaction terms. We present the results in Table 4, Column 1, which provide preliminary evidence of the association between P2P interactions and peer engagement behaviors. The results show that both interpersonal interactions and physical environments positively affect peer engagement behaviors; however, P2P interpersonal interactions have a stronger effect on peer engagement behaviors than physical environments. Specifically, the association between social interactions and peer engagement behaviors is positive and significant ($\beta=.425, p<.001$); the relationship between functional interactions and peer engagement behaviors is positive and significant ($\beta=.180, p<.001$); and physical environments have a significant positive effect on peer engagement behaviors ($\beta=.130, p<.001$). Estimates for offline interactions are as expected. Offline interactions positively correlate with peer engagement behaviors ($\beta=0.043, p<.001$).

In Table 4, Column 2, we present model estimates with interaction effects between social interactions, functional interactions and physical environments. The association between social interactions and peer engagement behaviors remains positive and significant ($\beta=.424, p<.001$); the relationship between functional interactions and peer engagement behaviors remains positive and significant ($\beta=.202, p<.001$); and physical environments still have a significant positive

Table 5
Correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13
peer engagement behavior	1.00												
social interaction	0.50	1.00											
functional interaction	0.60***	0.63***	1.00***										
physical environment	0.47***	0.51***	0.60***	1.00									
offline interaction	0.05***	0.04***	0.04***	-0.01	1.00								
clean	0.01	0.02	0.00	-0.02*	0.08	1.00							
Description	-0.01	-0.01	-0.01	-0.01	0.03***	0.48	1.00						
location	-0.02**	-0.03***	-0.04	0.00	0.02*	0.24	0.34	1.00					
safety	0.00	-0.01	-0.02*	-0.02*	0.04***	0.43***	0.46***	0.29***	1.00				
cost performance	-0.01	-0.01	-0.01	-0.02*	0.06***	0.45***	0.49***	0.33***	0.38***	1.00			
year	-0.04***	-0.07***	-0.08***	-0.04***	-0.08***	0.05***	0.05***	0.09***	0.05***	0.09***	1.00		
price	0.08***	0.15***	0.09***	0.06***	-0.38***	-0.09***	-0.13***	-0.11***	-0.09***	-0.12***	-0.13***	1.00	
Volume of reviews	-0.06***	-0.07***	-0.05***	-0.06***	0.14***	-0.01	-0.01	0.01	-0.01	-0.02*	0.06***	-0.29***	1.00

Note:
 *** p < 0.01
 ** p < 0.05
 * p < 0.1

effect on peer engagement behaviors ($\beta=.146, p<.001$). The results show a substitution effect between physical environments and social interactions ($\beta=-.0172, p <.001$), whereas the interaction between physical environments and social interactions is not significant.

We report estimates with interaction terms between social interactions, functional interactions, physical environments and offline interactions in Table 4, Column 3. The results show that the coefficients of social interactions, functional interactions and physical environments are positive and significant. The interaction effect between offline interactions and social interactions is positive and significant ($\beta=.0417, p <.001$), indicating that offline interactions improve the positive impact of social interactions on peer engagement behaviors. The interaction effect between offline interactions and functional interactions is positive and significant ($\beta=.0248, p <.001$), indicating that offline interactions improve the positive impact of functional interactions on peer engagement behaviors. However, the moderation effect of offline interactions on the relationship between physical environments and peer engagement behaviors is not significant, showing that offline interactions can only affect interpersonal interactions (social interactions and functional interactions) but not indirect physical environments. We report estimates with all interaction terms in Table 4, Column 4. All results are consistent with the previous model.

We present the Wald chi-square, Log-likelihood, LR test and AIC in Table 6, which can indicate the quality of model fitting. The Wald test (Wald chi-square) results can indicate whether the included variables are statistically significant to the model. LR test reflects the difference between the current mixed effects model and the ordinary linear model. The LR test results are presented in Table 6. These results indicate that the random factors included in the model are significant sources of variation for peer engagement behavior. The Akaike information criterion (AIC) considers the trade-off between the model’s fit quality and its complexity. It can be utilized to compare the goodness of fit of different models, enabling the selection of the most optimal one. Models with lower AIC values are considered superior because they offer a more favorable trade-off. Table 6 presents the Akaike information criterion (AIC), going from a model without interaction terms to the final model. The AIC value for the final model is better than the other models, suggesting that introducing the interaction terms improves the models

4.2. Robustness checks

We checked the robustness of our findings with alternative measures of peer engagement behaviors and presented the estimation results in Table 7. First, considering that the number of reviews for all rooms of a host reflects how many orders the host had completed in the past, which may determine the host’s popularity and accumulated reputation, we

added the variable "volume of reviews from all rooms" to the original model. We removed the variable "volume of reviews" (the number of reviews for one of the host’s rooms) to test the robustness of the model. The results are consistent with the main findings, supporting the robustness of our findings.

Second, we considered a different model estimation method. We use multilevel mixed effect Tobit regression to replace the previous multilevel mixed effect linear regression to estimate the model again. The estimated results are consistent with the main findings, which proves the robustness of our findings.

Third, we further checked the sensitivity of our results against the city where the listing is located. We chose the city as a control variable to retest our model. Consistent with the main findings, both direct and indirect P2P interactions have a positive and significant association with peer engagement, and the proposed interaction effect still holds.

5. Discussion

This article uses CTM to extract topics from unstructured customer review text data and further constructs a multilevel mixed linear model to test the impact of P2P interactions on peer customer engagement behavior in the context of P2P accommodation. This study contributes to the literature by systematically deconstructing the multiple dimensions of P2P interactions and exploring their impact on peer customer engagement behaviors. Our findings paint a comprehensive picture of how peer customers cocreate their experience and how experience cocreation influences their subsequent engagement behavior. We discuss the contributions in detail below.

5.1. Theoretical contributions

First, this paper reveals the causal relationship between experience cocreation and peer engagement behaviors, expanding the current value cocreation theory. From the view of service-dominant logic, experience cocreation and customer engagement behavior are two specific manifestations of value cocreation at different service stages (Jaakkola and Alexander, 2014). Peer customers form unique cocreation experiences through extensive participation and positive interactions, influencing their value cocreation process with service providers and platforms (Pralhad and Ramaswamy, 2004; Leclercq et al., 2016). However, there is limited literature exploring the relationship between experience cocreation and user fit behavior. This paper explores the causal link between the two forms of value cocreation and points out that customers build unique experiences through P2P interactions, affecting their subsequent engagement behavior. Experience cocreation and engagement behavior, as specific cocreation forms in different service stages, jointly

Table 6
Model results.

Variable	Model1	Model2	Model3	Model4
social interaction	0.425*** (0.021)	0.424*** (0.020)	0.420*** (0.020)	0.419*** (0.020)
functional interaction	0.180*** (0.020)	0.202*** (0.021)	0.181*** (0.019)	0.201*** (0.021)
physical environment	0.130*** (0.019)	0.146*** (0.020)	0.134*** (0.019)	0.148*** (0.020)
offline interaction	0.043*** (0.018)	0.042*** (0.018)	0.039*** (0.018)	0.038*** (0.018)
social interaction × physical environment		-0.0172*** (0.014)		-0.01583*** (0.014)
functional interaction × physical environment		0.0004 (0.012)		0.0006 (0.012)
offline interaction × social interaction			0.0417*** (0.019)	0.0387*** (0.019)
offline interaction × functional interaction			0.0248*** (0.019)	0.0254*** (0.019)
clean	0.0097 (0.017)	0.0105 (0.017)	0.0092 (0.017)	0.0099 (0.017)
description	-0.0080 (0.017)	-0.0077 (0.018)	-0.0087 (0.018)	-0.0084 (0.018)
location	0.0019 (0.017)	0.0020 (0.017)	0.0017 (0.017)	0.0018 (0.017)
safety	-0.0009 (0.016)	-0.0011 (0.016)	-0.0007 (0.016)	-0.0010 (0.016)
proprietries	0.0001 (0.017)	0.0009 (0.017)	0.0004 (0.017)	0.0012 (0.017)
year	0.0108 (0.018)	0.0116 (0.018)	0.0115 (0.018)	0.0122 (0.018)
price	0.0083 (0.015)	0.0070 (0.015)	0.0120 (0.015)	0.0107 (0.016)
volume of reviews	0.0021 (0.018)	0.0030 (0.018)	0.0014 (0.018)	0.0022 (0.018)
_cons	0.0021 (0.028)	0.0094 (0.028)	0.0004 (0.028)	0.0070 (0.028)
Log-likelihood	-12961.95	-12945.93	-12926.88	-12913.80
Wald chi-square	chi2(12) = 7329.18***	chi2(14) = 7392.70***	chi2(15) = 7444.57***	chi2(17) = 7497.75***
LR test vs. linear model	41.19***	38.65***	43.62***	41.16***
AIC	25,955.90	25,927.86	25,891.77	25,869.60
Root MSE of fixed portion	0.771	0.770	0.768	0.767

Notes: Number of samples =11,206, standard errors are in parentheses
 *p < 0.1
 ** p < 0.05
 *** p < 0.01

determine the value cocreation process in sharing accommodation.

Second, this research systematically deconstructs the multiple dimensions of P2P interactions and provides new insights into service interaction research. Some scholars have explored the positive relationship between host-guest interactions (experience cocreation) and customers' subsequent engagement behavior, e.g., Moon et al., (Moon et al., 2019); Shi et al., (Shi et al., 2019); Shuqair et al., (Shuqair et al., 2021); however, most of these studies regard P2P interactions as a single-dimensional variable (Walls, 2013); (Liu et al., 2021). We distinguish P2P interactions into interpersonal interactions (relationship-oriented social interactions and transaction-oriented functional interactions) and physical environments based on different interaction elements in experience cocreation. We found that interpersonal interactions substantially impact peer customer engagement behavior more than the physical environment. Furthermore, the findings clearly indicate a substitution effect between social interactions and physical environments; that is, social interactions can make up for the deficiencies of the environment to a certain extent. This finding can be

explained by the fact that social interactions provide emotional value to peer customers and play an essential role in establishing an interpersonal connection (Choo and Petrick, 2014). In addition, the findings highlight the importance of offline interactions, showing that the positive effects of social interactions and functional interactions are enhanced when face-to-face offline interactions occur. This study provides a comprehensive framework for analyzing multiple P2P interactions and provides new insights for effectively improving experience cocreation in the context of P2P accommodation.

Thirdly, this work focuses on peer engagement behaviors on sharing accommodation platforms, which is an extension of customer engagement theory (Steinhoff et al., 2019). Although research on customer engagement has gained attention in recent years, it mostly centers around brand engagement, virtual community engagement in social media contexts, and customer engagement behavior in traditional service industries. However, previous research has given little attention to peer engagement behaviors in the unique context of sharing accommodation, nor has it explored the driving factors of peer engagement behaviors from the perspective of P2P interaction. In traditional firms-customer relationship research, customer engagement has a clear brand/firm focus (Macey and Schneider, 2008; van Doorn et al., 2010), while peer engagement behaviors in sharing accommodation platforms are dispersed across a wide range of actor networks (Brodie et al., 2019; Lin et al., 2019). In addition, sharing accommodation platforms often control transaction quality through reputation and feedback systems (Einav et al., 2016), and the maintenance of these systems depends on the contribution of peer customers, such as the peer customers providing meaningful and authentic feedback (Cabral and Hortacsu, 2010). Therefore, compared to traditional industries, the development of sharing accommodation platforms relies more on peer engagement behaviors. This study focuses on the uniqueness of peer engagement in sharing accommodation platforms, enriching theoretical research in the field of customer engagement. This study also responds to recent calls for conducting empirical investigations of consumers' subjective experiences that are pertinent to peer engagement behaviors (Lin et al., 2019).

Fourth, this study provides a methodological contribution that addresses how to use unstructured text to analyze P2P interactions. This article identifies key topics of customer reviews based on CTM, helping scholars and practitioners understand the diverse needs of peer customers. This paper further combines text mining with econometric analysis and uses econometric models to analyze the proposed causal relationship. The qualitative content analysis method could not obtain complete information from the reviews, while the topic extraction method using LDA did not detect the correlation between the topics. The research method adopted in this paper helps scholars make more effective use of textual data and analyze specific research questions using a combination of qualitative and quantitative methods.

5.2. Practical implications

First, sharing accommodation should be dedicated to providing a pleasant experience environment and encouraging positive interactions between bilateral users. The findings point out that both P2P interactions and the physical environment positively promote peer engagement behaviors. Hence, sharing accommodation platforms need to effectively guide the interaction between peer customers and peer providers, allowing peer customers to create their own unique and personalized experiences jointly and seeking to encourage peer customers to contribute more resources. In a sharing accommodation context, services/products come from individual service providers. Unlike traditional business relationships, which involve an employment relationship, platforms cannot formally govern or regulate interactions between peer providers. Therefore, sharing accommodation platforms must abandon the product-centric view of the traditional lodging industry, focus on the personalized interactions between peer customers

Table 7
Results of robustness tests.

Variable	model1	model2	model3
social interaction	0.419*** (0.019)	0.423*** (0.019)	0.419*** (0.019)
functional interaction	0.203*** (0.020)	0.202*** (0.021)	0.211*** (0.019)
physical environment	0.149*** (0.020)	0.149*** (0.019)	0.150*** (0.020)
offline interaction	0.041*** (0.020)	0.038*** (0.020)	0.0383*** (0.021)
social interaction × physical environment	-0.0160*** (0.014)	-0.0159*** (0.014)	-0.0158*** (0.015)
functional interaction × physical environment	0.0005 (0.012)	0.0006 (0.012)	0.0006 (0.012)
offline interaction × social interaction	0.0378*** (0.019)	0.0385*** (0.019)	0.0387*** (0.019)
offline interaction × functional interaction	0.0256*** (0.019)	.0254*** (0.019)	.0253*** (0.019)
clean	0.0102 (0.017)	0.0100 (0.017)	0.0098 (0.017)
description	-0.0084 (0.017)	-0.0084 (0.018)	-0.0083 (0.018)
location	0.0022 (0.017)	0.0019 (0.017)	0.0018 (0.017)
safety	-0.0005 (0.016)	-0.0008 (0.016)	-0.0009 (0.016)
proprieties	0.0010 (0.017)	0.0012 (0.017)	0.0012 (0.017)
year	0.0124 (0.018)	0.0118 (0.018)	.0126* (0.018)
price	0.0131 (0.018)	0.0117 (0.018)	0.0103 (0.018)
volume of reviews	0.0004 (0.018)	0.0018 (0.017)	
city	.0259*** (0.024)	.0281** (0.028)	
volume of reviews from all rooms			-0.0014 (0.018)
_cons	0.0035 (0.024)	0.0062 (0.025)	0.0070 (0.028)
Log-likelihood	-12915.777	-12912.258	-12912.417
Wald chi-square		$\chi^2(18) = 7432.06^{***}$	$\chi^2(17) = 7499.59^{***}$
LR test vs. linear model	25.21***	32.24***	41.14***
AIC	25873.55	25878.52	25876.83
Root MSE of fixed portion	0.767	0.767	0.768

Notes: Number of samples =11206, standard errors are in parentheses

- *** p < 0.01
- ** p < 0.05
- * p < 0.1

and service providers and the experience of the environment they are surrounded by, and seek to create value together with peer customers. Service providers and platforms need to build an experience environment in which peer customers can cocreate unique and personalized experiences. Service providers cannot control how individuals create their unique experiences but can influence peers' cocreation experiences and subsequent engagement behaviors by controlling the experience environment.

Secondly, sharing accommodation platforms and service providers can improve peer engagement behaviors by guiding different types of P2P interactions. The findings indicate that both social interaction and functional interaction between bilateral users will actively influence peer engagement behaviors. Therefore, platform enterprises should not only guide service providers to conduct social interactions and provide more emotional support. They should also pay attention to the functional interactions and provide peer customers with specific service information and more decadent service options. In addition, we found that P2P interactions have a higher promoting effect on peer engagement behaviors when there are offline interactions. Therefore, service providers should provide more offline interaction scenes and expand the availability for P2P offline interactions to establish intimate personal relationships and enhance the positive experience of peer customers.

Thirdly, platforms and service providers should highlight the critical role of social interactions in enhancing peer engagement behaviors. Overall, compared with functional interactions, social interactions generally exert a more substantial influence on strengthening peer engagement behaviors. According to the conclusions, social interactions rather than functional interactions can compensate for the deficiency of the physical environment to a certain extent. Therefore, when the product does not fully meet the customers' needs, a higher level of P2P social interactions can reduce the possibility of negative emotions. Hence, when resources are scarce, platforms ought to facilitate more excellent P2P social interactions to maximize peer customers' resource contributions. Traditional service industries gain a competitive advantage by providing standardized and high-quality services to customers through unified employee training. The sharing accommodation platform cannot implement formal governance to regulate the providers'

service. However, it can improve the customer experience by increasing the social connection between peers and establishing two-way trust through personalized social interaction to improve peer customer engagement behavior.

5.3. Limitations and future research directions

This study has some limitations. First, this article only obtained review data from the P2P accommodation industry (Xiaozhu.com). In the future, data from other industries (such as mobility services) can be collected to further validate and expand the findings of this paper. Second, this paper only focuses on the main effect of P2P interactions on peer customer engagement behavior and has not focused on the internal mechanism of this impact. In the future, we can further analyze the potential impact mechanism of P2P interactions on peer customer engagement behavior. Third, using customer reviews for analysis may lead to sample selection bias. In the future, survey or laboratory data can provide additional evidence for sample selection bias by simulating real P2P transaction scenarios. Fourth, there are engagement behaviors specific to platforms and engagement behaviors specific to providers, and there is not always a spillover effect between the two types of engagement behaviors. Thus, follow-up research can focus on the difference in the impact of multiple P2P interactions on these two kinds of engagement behaviors.

CRedit authorship contribution statement

Yuquan Qi: Methodology, Data curation. **Xiaorong Fu:** Writing – review & editing, Funding acquisition, Conceptualization. **Jing Pang:** Writing – original draft, Methodology, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.ijhm.2024.103764](https://doi.org/10.1016/j.ijhm.2024.103764).

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