

Examining continuance use on social network and micro-blogging sites: Different roles of self-image and peer influence

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ABSTRACT

Social network sites (SNS) and micro-blogging sites are popular yet distinctive social media. Previous studies have focused on one type of social media and thus overlook how the distinctive features of SNS and micro-blogging sites may affect underlying motivational mechanisms. To address this research gap, we draw from the self-regulation framework and propose a research model to explain how different appraisal factors (i.e., self-image and peer influence) affect continuance use through emotional responses (i.e., a sense of belonging and satisfaction). Furthermore, we argue that the effects of these appraisal and emotional factors are different across types of social media. We tested our research model by survey data collected from SNS and micro-blogging sites. The results confirm our hypotheses: First, self-image is a more significant factor in increasing SNS users' sense of belonging and satisfaction, while peer influence has a greater effect on micro-blogging sites users' sense of belonging and satisfaction. Second, the sense of belonging explains the greater variance of continuance intention in SNS as compared with satisfaction. A few theoretical and practical implications are discussed related to our findings on different motivational mechanisms.

1. Introduction

Recent years have witnessed the rapid growth and popularity of social media, and it has exhibited its great value in social impact (Chae, 2018), business and marketing (Dwivedi, Kapoor, & Chen, 2015; Luo & Zhai, 2017; Nisar, Prabhakar, & Strakova, 2019; Tajvidi, Richard, Wang, & Hajli, 2018), education (Arteaga Sánchez, Cortijo, & Javed, 2014; Sobaih, Moustafa, Ghandforoush, & Khan, 2016), and political effects (Lee & Xenos, 2019). The growing body of research related to social media has gradually diverged into different streams (Kapoor et al., 2018; Shiao, Dwivedi, & Yang, 2017; Shiao, Dwivedi, & Lai, 2018) and show there are different types of social media: one is comprised of social network sites (SNS) such as the Facebook, Cyworld, VKontakte, and RenRen, which are mainly used for social interaction among friends (Ferrara, De Meo, Fiumara, & Provetti, 2014; Jung, Pawlowski, & Kim, 2017; Li & Chen, 2014); the other includes micro-blogging sites such as Twitter and Weibo, which often serves as “an awareness platform” for public events (Singh, Dwivedi, Rana, Kumar, & Kapoor, 2017; Son, Lee, Jin, & Lee, 2019) and allows users to post short messages on topics ranging from personal hobbies and interests to

current affairs and politics (Aladwani & Dwivedi, 2018; Grover, Kar, Dwivedi, & Janssen, 2018).

Though both SNS and micro-blogging sites are both popular forms of social media, they are different in many ways. First, the motivations to participate in SNS and micro-blogging sites are, on the surface, quite similar, but they are found to be different when examined more deeply. SNS users focus on keeping up with their offline acquaintances by sharing texts, photos, videos, or music (Arteaga Sánchez et al., 2014; Ifinedo, 2016) whereas micro-blogging users focus on keeping up with trends, opinions or public events (Son et al., 2019) by following official accounts celebrities, musicians, others with whom they have similar interests or participated in the same event (Jansen, Sobel, & Cook, 2011). Moreover, SNS users build bi-directional and reciprocal social ties, and there needs to be mutual consent before forming a relationship (Kwak, Lee, Park, & Moon, 2010). In contrast, micro-blogging users build uni-directional networks for following other users without being followed back or obtaining the consent of those followed (Boyd & Ellison, 2007; Kwak et al., 2010). Thus, SNS consists of intimate social networks, where users are friends, families, and colleagues (Jansen et al., 2011). Although there has been a scant of literature over the use

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motivation and theoretical model evaluation of social media participation (Hsieh, Rai, & Keil, 2008; Kapoor et al., 2018; Shiau et al., 2018), limited amount of studies have compared and explored the dissimilarities between the motivations and network characteristics of SNS and micro-blogging. Jansen et al. (2011) have compared how users differ in terms of motivations for knowledge sharing via Facebook, MySpace, myYearbook, and Twitter through descriptive and cluster analysis, though they have not probed into the theoretical mechanisms of such differences. Also, the work of Hughes, Rowe, Batey, and Lee (2012) has shown that there are differences in the correlations between personality and the use of SNS and micro-blogging sites. These interesting findings inspire research inquires on whether such differences may lead to different underlying mechanisms of continuance use. Therefore we explore the different relationships between user motivations and continuance use in SNS and micro-blogging sites.

Drawing from the self-regulation framework (Bagozzi, 1992), we develop a research model to compare the different motivational mechanisms of continuous use for SNS and micro-blogging. The rest of the paper is structured as follows. The second section discusses the literature on social media and the self-regulation framework. This is followed by our research model and the hypotheses. The fourth section is dedicated to the methodology. The fifth section analyzes the data and presents the results. Finally, the sixth section discusses the findings, theoretical and practical implications, limitations, and future research directions in this study.

2. Research background: comparison of SNS and micro-blogging sites

In this section, we present a comparison of the features of SNS and micro-blogging sites based on the following three aspects: (1) the motivations to participate, (2) the types of social ties and network created by the users, and (3) the types of information disseminated through the network. Through the comparison, we found that although both SNS and micro-blogging sites enable users to fulfill their social and informational goals, there are distinctions between the two types of social media in terms of the focus, types of social ties, and the content of information disseminated.

Prior studies have found that users of SNS and micro-blogging sites participate in order to fulfill social and informational needs (Arteaga Sánchez et al., 2014). On the one hand, users can use social media to manage personal and professional relationships (Dermentzi, Papagiannidis, Osorio Toro, & Yannopoulou, 2016; Ku, Chen, & Zhang, 2013; Liu, Cheung, & Lee, 2010), build their reputation or improve their social status (Basak & Calisir, 2015), or show their conformity to social norms (Ku et al., 2013). On the other hand, social media supports users seeking and/or conveying information, such as obtaining investment advice (Zhang, Fuehres, & Gloor, 2011), coordinating work projects (Xu, Prybutok, & Wen, 2012), and gathering public opinions (Ku et al., 2013).

Taking a closer look in the literature, we find that users of SNS focus on social needs (Chen, 2013; Ifinedo, 2016) while users of micro-blogging sites focus on informational needs (McFedries, 2007). For example, Ellison, Steinfield, and Lampe (2007) showed that students use Facebook (SNS) to keep in touch with high school acquaintances and classmates. The social relationships in SNS are reciprocal (Rousseau, Eggermont, & Frison, 2017; Tulin, Pollet, & Lehmann-Willenbrock, 2018) or overlap with offline connections such as families, friends, and colleagues (Jansen et al., 2011). In contrast, micro-blogging users are inclined to follow strangers, including field experts, stars, and celebrities (Zhang & Pentina, 2012), and publish short texts to express opinions or interests (sometimes with embedded photos) (McFedries, 2007). For example, Jansen et al. (2011) found that following celebrities and musicians are one of the most frequent social activities on Twitter (i.e., micro-blogging sites). In addition, Son et al. (2019) found that users are not only supported by micro-blogging sites

in getting informed with the updated and general information of catastrophic event such as earthquake at the early phase, but also rely on micro-blogging sites to publish and get accurate information related to the catastrophic event at the later stage.

Though both social media enable users to create social ties, SNS and micro-blogging sites provide different ways of establishing them. Users of SNS are required to establish mutual consent in order to create a bi-directional social tie (Rousseau et al., 2017). In other words, the social ties in SNS require both parties to follow each other. Such bi-directional social ties allow users to replicate offline networks, which are a stable and strong social relationship (Granovetter, 1973; Shiau et al., 2017). Such bi-directional social ties are supported and strengthened with activities on SNS such as photo-tagging (Dhir, Kaur, & Rajala, 2018) and gift-giving (Mamonov & Benbunan-Fich, 2017). For example, Mamonov and Benbunan-Fich (2017) explored users' beliefs of Facebook gift-giving i.e. a social commerce service that is associated with other SNS functionalities such as birthday notifications of Facebook friends. Mamonov and Benbunan-Fich (2017) found that such gift-giving service has strong social utility and symbolic value in promoting social ties between users who give or receive the gifts. In contrast, micro-blogging sites allow a user to build a uni-directional social tie if s/he chooses to be a follower (Kwak et al., 2010). Micro-blogging users can follow any other users, and users being followed do not need to reciprocate. With uni-directional social ties, users of micro-blogging sites, who may themselves follow a small number of people, can publish information with no intended audience but create a great impact when they attract many followers. For example, Capriotti and Ruesja (2018) found that though a majority of CEOs used Twitter to publish their opinions and thoughts with more than 160,000 followers on average, such social ties mainly support one-way communication from the CEOs to the followers rather than dyadic interaction.

Lastly, information in SNS is more social or personal whereas the information in micro-blogging sites is more cognitive-based or impersonal (Hughes et al., 2012). For example, the contents generated by Facebook users are often about personal moments, daily life, or interesting experiences with friends (Hughes et al., 2012). Information shared via SNS, such as messages and updated personal profiles, is meaningful for friends, family, or specific groups of acquaintances (Jansen et al., 2011). In turn, reading profile updates and posts is also an efficient and meaningful way for users to learn about their friends' interests, hobbies, and relationship status (Mansour, 2012). In contrast, information shared through micro-blogging sites is short, frequent, and fleeting (e.g., breaking news, real-time content, and popular trends). For example, Twitter users publish messages with a 140-character limit and follow others in order to receive their "tweets" (Kwak et al., 2010; Vergeer, Hermans, & Sams, 2013). A user, as a receiver, can forward these messages, which are called "retweets." The retweet mechanism exemplifies the network effect, and messages can be disseminated beyond the reach of the original tweet's followers (Kwak et al., 2010).

3. Conceptual background and hypotheses

3.1. Self-regulation framework: appraisal, emotional, and coping elements

Inspired by Lazarus's appraisal theory of emotion (Lazarus, 1991), Bagozzi (1992) proposes the self-regulation framework by adapting the concepts of appraisal, emotional, and coping components from the literature in psychology on basic emotions in order to further the understanding of behavioral intention within business contexts. There are three components in the self-regulation framework: appraisal process, emotional reactions, and coping responses. Appraisal process refers to the process in which people identify and evaluate what is significant in the situation in order to address personal concerns or fulfill personal goals (Moors, Ellsworth, Scherer, & Frijda, 2013). The second component, emotional reaction, refers to the positive or negative emotional responses as the outcome of the appraisal. The third component, coping

response, refer to the one's intention of taking actions to maintain the positive outcome or avoid negative consequences based on the emotional reaction. The self-regulation framework explains how an individual forms behavior intention in a two-step process with the three aforementioned components: first, an individual appraises the situation and forms emotional responses based on it; then, the individual exhibits a specific behavioral tendency or coping strategy triggered by the emotional responses in the first step (Bagozzi, 1992). The self-regulation framework extends and increases the explanatory power of attitude theories, including the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1991), by introducing the mediating role of emotional reactions. In other words, a person is motivated to perform an intended behavior when his/her belief or attitude towards a behavior becomes emotionally significant.

The self-regulation framework is an appropriate theoretical framework for understanding a user's continuance intention with social media. First, the self-regulation framework can explain the effects of goal-congruent motivations (Moors et al., 2013); therefore it can provide a theoretical foundation to understand how the differences in the social and informational goals of SNS and micro-blogging sites may lead to the differences in the motivational mechanism of users' behaviors. Second, this framework explains that the appraisal process is situational and affects behavior intention through different emotional reactions. Given the effect of the appraisal process is situational and indirect, it may help to understand why previous findings on the effect of appraisal factors on the use of social media are mixed. For example, Ma and Agarwal (2007) found that self-image leads to one's knowledge contribution, but Kankanhalli, Tan, and Wei (2005) found that such an effect is insignificant. Ku et al. (2013) identified social norm as a significant factor in SNS continuance, yet Dermentzi et al. (2016) showed the effect to be insignificant. By introducing the mediating role of emotional reactions from the self-regulation framework into our research model, we can probe into why such mixed results persist. Lastly, the self-regulation framework has been empirically tested in various business contexts such as online hotel reservations use (Karahanna, Polites, Seligman, & Williams, 2009) and continuance use intention with SNS (Lin, Fan, & Chau, 2014). Thus, we use the self-regulation framework as the overarching theoretical framework for our research model in order to understand the continuance use of social media. Based on the self-regulation framework, we propose a research model to explain social media continuance use (Fig. 1).

We propose that there are two factors in the appraisal process of social media continuance by taking the communication perspective of social media from the social presence theory (Short, Williams, & Christie, 1976): self-image as the factor related to a sender's perspective; the other one is peer pressure as the factor from the recipient's perspective. Social presence theory is appropriate for understanding the continuance use of social media because of its communicative nature. Prior research has recognized the interaction in social media as a type of computer-mediated communication (Han, Min, & Lee, 2015; Han, Min, & Lee, 2016), in which users consider whether to continue depend on how well the social media functions as a medium to support the communication process with other users (Han et al., 2015, 2016). Social presence theory proposes that in the communication process, communicators, who can be either the sender or recipient of the message, appraise the communication to be effective when they feel high awareness of each other (Short et al., 1976). Self-image, as a factor from the perspective of the message sender, reflects as the perception of a positive reputation (Kankanhalli et al., 2005), which users can communicate to each other using social media tools such as avatars, profiles, purchased digital items (Kim, Gupta, & Koh, 2011) and other personalization services. Self-image congruity enhances user's continuance intention of online services (Kang, Min, Kim, & Lee, 2013). Peer influence, which is derived from a message recipient perspective, reflects the impact of one's peers in deciding whether to perform or avoid certain actions (Burkey, 2005). A person demonstrates the

influence of peers by imitating others (Sun, 2013) or complying with the norms, expectations, or pressure imposed by family members, relatives, friends, peers, and the government (Hsieh et al., 2008). In social media, a user, as the message recipient, may perceive the high influence of other users with the information disseminated in the social media. For example, a user may receive the product related information from and get persuaded to form positive consumption attitudes by the members in the social media (Shareef, Mukerji, Alryalat, Wright, & Dwivedi, 2018). To sum up, we propose that social media users consider their self-image from a sender's perspective and peer influence from the recipient's perspective to be the appraisal factors in continuance use of social media.

Further, we adapt the self-regulation framework to understand continuance use by introducing the sense of belonging and satisfaction as the emotional reactions based on social media literature (Lin et al., 2014). Emotional reactions as the second component in the self-regulation framework can be adapted to understand users' positive or negative subjective affects responses resulting from their appraisal of social media. First, the sense of belonging is considered to be a strong and enduring emotional reaction of users in a social media context, which reflects users' identification and attachment to a social community and its affiliated members (Lin et al., 2014). Prior social media research found that the sense of belonging shows the extent to which a user feels to be an integral part of the social media and reflects a positive subjective feeling of their relationship with other members (Zhao, Lu, Wang, Chau, & Zhang, 2012). Such emotion reaction plays an important role in forming their attitudes of conducting pro-social behavior in an online context such as knowledge contribution (Zhao et al., 2012) and forming social media habit (Liu, Shao, & Fan, 2018). Second, satisfaction, as another emotional reaction, reflects the users' overall contentment, fulfillment response, and overall evaluation of a system, product, or service (Kim & Lee, 2011). Compared with a sense of belonging, satisfaction is a weak and transient emotional reaction (Lin et al., 2014). Taking a cumulative perspective, users derive satisfaction from their appraisal of prior interaction with the technology or service to decide how worthy it is to continue to use it, such as mobile communication applications (Wang, Ou, & Chen, 2019). Though satisfaction is suggested as a necessary condition in considering whether to continue to use a service, prior literature in online contexts notices that it is not sufficient to ensure such continuance intention applications (Wang, Wang, & Liu, 2016, 2019). Therefore, we propose dual emotional reactions to the self-regulation framework to understand social media continuance use.

Lastly, we adapt the continuance intention and continuance use in the social media literature as the coping responses in the self-regulation framework. As proposed by self-regulation framework, coping response as the third component shows an individual's belief and plan of taking actions to maintain the positive outcome or avoid negative consequences based on the emotional reactions (Moors et al., 2013). Continuance use has been identified as an important issue for the sustainability and stable performance of social media (Lin et al., 2014; Zhao et al., 2012). As coping responses in social media context, continuance intention use brings positive outcomes to the social media and the users with stable flow of knowledge contribution, interaction and network size (Butler, Bateman, Gray, & Diamant, 2014) whereas continuance intention reflects user's attitude and willingness to engage in activities to create such a positive outcome. In summary, we contextualize the self-regulation framework with important factors in the social media literature to propose a research model to explain how the motivation mechanisms may vary across different social media.

3.2. Research model

We discuss the research model (Fig. 1) in the following sequence. First, we propose continuance intention and continuance use to be coping responses. Second, we argue how the emotional responses (i.e.,

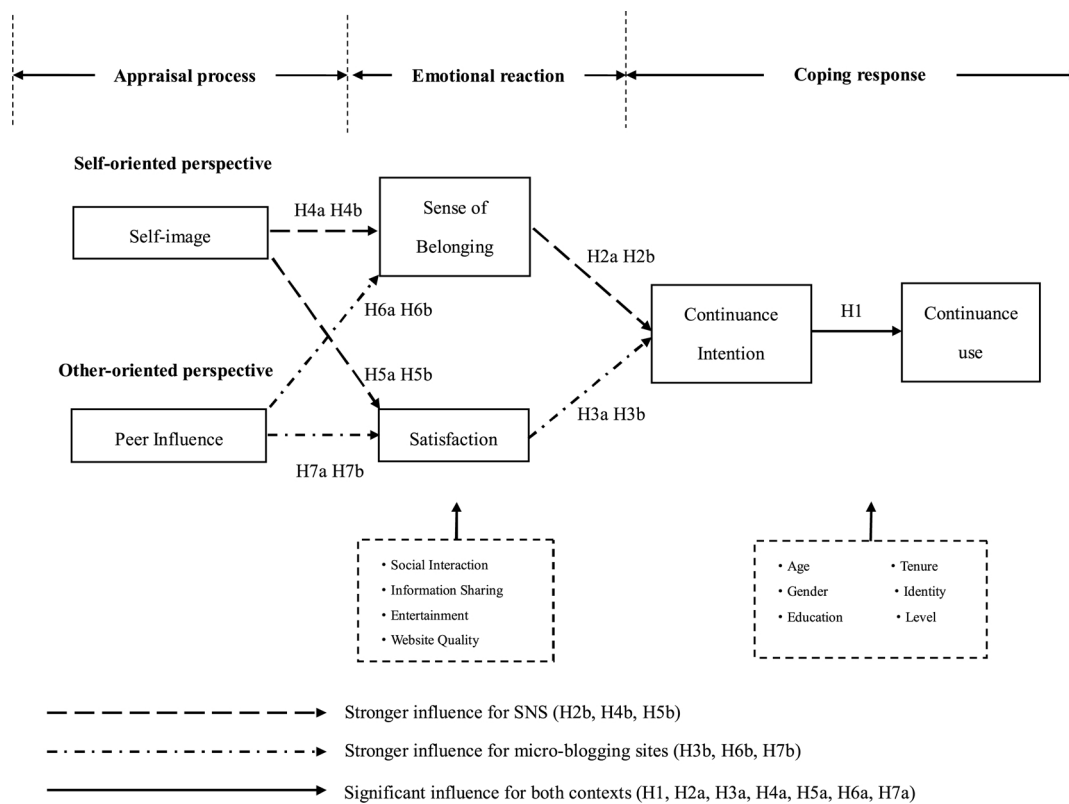


Fig. 1. Research model.

Note: The control variables used in Fig. 1 are not reported here for reasons of clarity and presentation.

a sense of belonging and satisfaction) motivate continuance intention and compare their differences in the different types of social media. Third, we discuss the general and different effects of the appraisal components (i.e., self-image and peer influence) on emotional reactions in SNS and micro-blogging sites.

3.2.1. Coping response

In social media, users' continuance intention reflects the extent to which they are planning or attempting to continue using a particular social media (Bhattacharjee, 2001a). Continuance use of social media refers to users' continued use of it for a certain period of time after initial adoption (Limayem, Hirt, & Cheung, 2007). According to TRA and TPB, people form an attitude and intention before performing a particular behavior. Intention reflects how much effort a person is willing to exert to perform a certain action (Ajzen, 1991). The intention is the central motivational antecedent that leads to a specific behavior. Prior research has provided empirical evidence of the positive effect of intention on the use of information technology across different contexts, such as workplace information systems (Venkatesh, Morris, Davis, & Davis, 2003) and voluntary knowledge sharing in online communities (He & Wei, 2009). In addition, such an effect is further supported by the meta-analysis conducted by Turner, Kitchenham, Brereton, Charters, and Budgen (2010). As people use social media voluntarily, they can determine whether to continue to use it according to the extent to which they intend to continue to use it. Thus, we propose the following hypothesis:

H1. Users' continuance intention is positively related to continuance use for social media.

3.2.2. Emotional reactions

3.2.2.1. Sense of belonging. The self-regulation framework proposes that a person perform certain actions or make decisions as a means of

coping with emotional responses (Bagozzi, 1992). In the literature, a sense of belonging can be defined as a feeling of membership, a sense of influence or being influenced, a feeling of integration and fulfillment of social needs, and a shared emotional connection with a community (Gangadharbatla, 2008; Kim & Koh, 2003; Kim, Kim, & Wachter, 2013; Lin et al., 2014). In the present study, a sense of belonging is defined as an emotional response that describes users' attachment and involvement with the social media. The sense of belonging reflects how strongly users feel the participation in the social media to be significant in their daily life. As a result, users with a strong sense of belonging will put forth more effort or make plans to take part in activities in the social media, such as reading others' posts, sharing knowledge, making new connections, and maintaining existing connections. Previous studies have also found the positive effects of sense of belonging on one's continuance intention in different social media, such as SNS (Lin et al., 2014) and micro-blogging sites (Wang, Kang, & Fu, 2013). Thus, we propose the following hypothesis:

H2a. Users' sense of belonging is positively related to continuance intention for social media.

Although prior studies have suggested that a sense of belonging influences users' continuance intention in social media, the strength of such an effect may be contingent upon the type of social media. These different effects may stem from the differences in the type of network users create using the social media. Users build bi-directional networks consisting of closed, offline acquaintances through frequent interactions in SNS (Jansen et al., 2011). In contrast, users of the micro-blogging sites establish uni-directional networks characterized by distant relationships and infrequently interactions (Hansen, Mors, & Lovas, 2005; Levin & Cross, 2004). Compared with a uni-directional network, the success of a bi-directional network relies more on the extent to which users feel attached to and socially supported by it (Granovetter, 1973; Levin & Cross, 2004). As a result, users' attachment to an SNS

should have a greater influence on continuous intention than that to a micro-blogging site. Thus, in determining users' continuance intention, a sense of belonging should have a greater effect in the SNS than in the micro-blogging sites. Thus, we propose the following hypothesis:

H2b. The positive relationship between users' sense of belonging and continuance intention is stronger for the SNS group than for the micro-blogging group.

3.2.2.2. Satisfaction. The self-regulation framework proposes that a coping response is subjected to the positivity of the outcome appraisal because people tend to approach or repeat actions with positive outcomes and avoid negative ones (Bagozzi, 1992). The more positively a person appraises a situation, the more likely s/he is to seek to repeat such a positive outcome by repeating the corresponding behaviors. Following the conceptualization of Bhattacharjee (2001a) and Lin et al. (2014), the present study defines satisfaction as an affective state stemming from users' appraisal of their prior use and experience of the social media. Users perceive high satisfaction when they evaluate their prior use as positively meeting their goals or expectations. In the social media, users aim to fulfill their informational goals such as learning about current issues or gathering information about the lives of their friends (Jansen et al., 2011; Oh & Syn, 2015). Such goals can be achieved by participating in activities on social media, such as reading, commenting on, or forwarding others' posts. Thus, users of social media are motivated to form high intention to use it continually as an effective means of fulfilling their informational goals in the future. In addition, the positive effect of satisfaction on continuance use have been tested and proved in different contexts, such as Software-as-a-Service (Benlian, Koufaris, & Hess, 2011), mobile Internet services (Deng, Turner, Gehling, & Prince, 2010; Zhao & Lu, 2012), and the design and analysis of information systems (Recker, 2010) and SNS (Gwebu, Wang, & Guo, 2014; Park, 2014). Thus, we propose the following hypothesis:

H3a. Users' satisfaction is positively related to continuance intention for social media.

The present study argues that satisfaction may have different effects on users' continuance intention of micro-blogging sites and SNS. Such differences are caused by the differences in users' purposes and social ties across micro-blogging sites and SNS. On one hand, users of micro-blogging sites aim to address their need for learning but less for social interaction. Both Jansen et al. (2011) and Oh and Syn (2015) conducted empirical studies comparing differences in user objectives across social media. The results of both studies show that learning information ranks as the most important purpose in micro-blogging sites such as Twitter but is rated as the second most important one in the SNS. Therefore, users may derive satisfaction when the micro-blogging sites can assist them in their goal to learn. As discussed in the previous section, satisfaction reflects users' temporal evaluation of how well the social media performs in fulfilling their informational need (Bhattacharjee, 2001b). According to the self-regulation framework, users decide which emotional response to cope with in conjunction with their situational purposes (Bagozzi, 1992). Given the comparative important role of informational needs, satisfaction plays a more important role in determining whether a user will continue to use the micro-blogging sites but less so the SNS. Therefore, we expect users' satisfaction with the system to have a greater influence on the continuous intention for micro-blogging sites than for SNS. We propose the following hypothesis:

H3b. The positive relationship between user satisfaction and continuance intention is stronger for the micro-blogging group than for the SNS group.

3.2.3. Appraisal process

3.2.3.1. Self-image. Extending the definition provided by Kankanhalli et al. (2005), the present study defines self-image to be a cognitive appraisal of the extent to which a person considers himself to have the positive, enhanced reputation and identity on the social media. A social media can be understood as a popular form of computer-mediated communication (Han et al., 2015, 2016). Prior literature on computer-mediated communication indicates that users leverage self-disclosure and impression management in order to be judged appropriately by those they communicate with (Tidwell & Walther, 2002). With appropriate self-image established, users can reduce negative consequences because of the features of computer-mediated communication, such as asynchronous interaction and a lack of social contextual cues (Tidwell & Walther, 2002; Walther, 1996). When users succeed in creating appropriate and positive self-images on a social media, they are more likely to communicate and interact effectively with others because both parties reach a mutual understanding of identity. In addition, users can take advantage of the asynchronous interaction to control and optimize their self-image (Walther, 1996) on the social media. Unlike in an offline network, users on a social media have greater flexibility and freedom in choosing what and when to express as well as with whom to connect. Users can edit personal profiles, upload photos, post blogs, and perform other self-presentation activities for a carefully tailored self-image (Shao, 2009). For example, users are often motivated to contribute knowledge in order to enhance their professional reputation in online communities (Donath, 1999; He & Wei, 2009).

Users can appraise the feedback and responses, such as the valuation of reputation and the number of fans, from the network on the social media in order to evaluate their image. If the appraisal turns out to be positive, users will gain a sense of achievement and emotional bonding with the social media (Kim & Koh, 2003). According to the self-regulation framework (Bagozzi, 1992), users develop a stronger sense of satisfaction with and belonging to the social media when they feel that their self-expression goals can be fulfilled successfully. Therefore, we propose that self-image is positively related to social media users' satisfaction and sense of belonging with the following hypothesis:

H4a. Self-image is positively related to a user's sense of belonging on social media.

H5a. Self-image is positively related to user satisfaction with social media.

The present study argues that self-image may act as a stronger appraisal factor for evoking emotional responses (i.e., a sense of belonging and satisfaction) in SNS than in micro-blogging sites for two reasons. First, users focus more on activities and motivations related to social connections in SNS than with micro-blogging sites. Prior studies have compared the activities and motivations for different social media (Jansen et al., 2011; Oh & Syn, 2015). Jansen et al. (2011) found that users tend to engage in social activities such as sharing photos or conversing with friends and acquaintances. According to the self-regulation framework, the effect of appraisal factors is subjected to whether it is congruent with the goal. Thus, users may consider building up a self-image as their priority as participating in social activities with close and pre-existing friends is the primary goal on SNS. In contrast, users of micro-blogging sites rate social engagement as the second most important motivation following learning information (Jansen et al., 2011; Oh & Syn, 2015), which implies that appraisal factors related with social activities are less important.

Second, users fulfill their need for self-expression differently across SNS and micro-blogging sites. In SNS, users tend to engage in explicit self-expression such as direct self-disclosure, personal homepage management, and photo and video uploads to convey their personality (Amichai-Hamburger & Vinitzky, 2010). Explicit self-expression functions provided by SNS enable users to manipulate and control their self-

image. Therefore, users are likely to evaluate whether their experience of SNS is satisfactory or not depending on whether they can achieve positive outcomes using the self-expression function. In contrast, users of micro-blogging sites express their preferences, interests, and opinions implicitly by forwarding or following different kinds of information streams (Kwak et al., 2010). Thus, self-image becomes a less salient factor in determining how they feel about the micro-blogging sites. Based on the above discussion, we propose the following hypothesis:

H4b. The positive relationship between self-image and a sense of belonging is stronger for the SNS group than for the micro-blogging group.

H5b. The positive relationship between self-image and satisfaction is stronger for the SNS group than for the micro-blogging group.

3.2.3.2. Peer influence. Based on the definition of peer pressure from Santor, Messervey, and Kusumakar (2000), the present study defines peer influence as the extent to which a user feels pressured, urged, or motivated to use a social media because of the pressure or behavior posed by agents. Agents in peer influence refer to those who communicate norms, attitudes, and motivations towards a behavior through different approaches, such as frequent social interaction, the enforcement of rewards and punishment, and imitation of a role model (Moschis, Gilbert, & Churchill, 1978). As sources of the subjective norms that shape users' continuous use of technology, agents can be family, relatives, friends, governments, schools (Hsieh et al., 2008), or mass media (Moschis et al., 1978). The overlap between the agents and the network users built into social media enables users to develop social relationships through social media use, which fosters a sense of belonging and improves user performance. For example, Hall and Davison (2007) found that users of online learning blogging who were also classmates in an offline setting acted as peer tutors for each other through active knowledge sharing and social support. Another example from Davison, Ou, and Martinsons (2018) showed that *guanxi*, a kind of direct and reciprocal social connection, influences employees to use social media for knowledge exchange, which in turn develops and maintains their *guanxi* network and work performance.

The effect of peer influence has been discussed in the literature of consumer socialization (Moschis et al., 1978; Wang, Yu, & Wei, 2012) and organizational management (Brzozowski, Sandholm, & Hogg, 2009; Davison et al., 2018). Similar to the above-mentioned contexts, social media enables users to create social ties, which vary in terms of strength, interaction frequencies, recency, commonality, and sources (i.e., how they started the connection) (Tulin et al., 2018) for social interaction and information exchanges. Through active participation on the social media, users can increase their number or strength of social ties while relieved of the pressure of missing out on learning new information. Thus, we propose the following hypothesis:

H6a. Peer influence is positively related to users' sense of belonging generated by social media.

H7a. Peer influence is positively related to users' satisfaction with social media.

We argue that the effect of peer influence on users' emotional responses is stronger in the context of micro-blogging sites than that of SNS. As previously discussed, the overlap or transfer between offline and online social ties enables users to develop a sense of belonging and fulfill informational goals at the same time. Agents that exert peer influence include not only family and close friends but also classmates, coworkers, and the mass media (Hsieh et al., 2008; Moschis et al., 1978). Therefore, the close, bi-directional networks of SNS may only represent a small subset of the agents of peer influence. Users tend to exert more control over their networks in SNS (Dermentzi et al., 2016), which is another factor that limits the scope of networks that users build on SNS. In contrast, users are likely to leverage the comprehensive

and uni-directional ties in micro-blogging sites to reach a more diverse pool of information, related to such topics as investment (Zhang et al., 2011) and tourism (Luo & Zhai, 2017). Therefore, compared with SNS, users of micro-blogging sites may attribute more importance to how their informational needs imposed by peer influence are satisfied. Thus, we present the following hypotheses:

H6b. The positive relationship between peer influence and a sense of belonging is stronger for the micro-blogging group than for the SNS group.

H7b. The positive relationship between peer influence and satisfaction is stronger for the micro-blogging group than for the SNS group.

3.2.4. Control variables

In order to take full account of other factors that may influence satisfaction and the sense of belonging, control variables were included in our research model to ensure that the empirical results were not due to covariance with other variables (Fang et al., 2014). In particular, we included social interaction, information sharing, entertainment, and website quality as the control variables for satisfaction and a sense of belonging. Social interaction is defined as the social media users acting toward or responding to one another (Chen, 2007). Information sharing in social media involves the actions of users seeking information (Shi, Lee, Cheung, & Chen, 2010) and information disseminating (Krumm, Davies, & Narayanaswami, 2008). Entertainment refers to using social media for filling free time, taking a break, and having fun (Ellison, Steinfield, & Lampe, 2006). Website quality is defined as website reliability, ease of access, response time, and flexibility (Lin, 2008). We select these particular variables because of their potential impacts on satisfaction and the sense of belonging, as suggested by the previous literature (Beaudry & Pinsonneault, 2010; Hsieh et al., 2008; Kang & Lee, 2010; Lin et al., 2014; Zhang & Pentina, 2012; Zhao & Lu, 2012; Zheng, Zhao, & Stylianou, 2013).

In addition, to fully accounting for the differences among users, this study also included six demographic variables as control variables for user's continuance intention and continuance use: age, tenure, gender, identity, education, and level. Identity is defined as whether the user is a student or a professional. Level represents the user's integral level. It is likely that an individual's continuance intention and continuance use may be affected by demographic characteristics, as suggested in the prior literature (Fang et al., 2014; Venkatesh et al., 2003).

4. Research methodology

4.1. Research sites

RenRen is one of the largest SNS providers in China and facilitates interpersonal interactions through information sharing among registered members. RenRen was founded in December 2005 and originally known as Xiaonei. Initially intended for college students, the company later broadened its service to include the general public in August 2009 and changed its name to RenRen. Similar to Facebook, RenRen allows users to build personal profiles and social networks. Users can post photos and journals as well as update their social status in real time in order to share their lives with their network of friends. RenRen reported that its monthly active users in December 2017 were approximately 32 million (Renren Inc., 2017).

Weibo, a social media that is similar to Twitter, is one of the largest micro-blogging sites in China. Weibo posts are limited to 140 words. However, unlike Twitter, Weibo users are able to embed pictures and videos, which significantly enrich the information and content shared with others (Zhao & Rosson, 2009). Weibo also provides a more comprehensive portal page that includes extensive content lists such as rankings and hot topics (Zhang et al., 2011). Weibo began its service in October 2009. As of December 2017, Weibo had 392 million monthly

Table 1
Descriptive statistics of respondents.

	RenRen	Weibo
Age		
15–20	20.9%	17.3%
21–25	55.4%	40%
26–30	23.6%	26.8%
> 30	0.1%	15.8%
Gender		
Male	39.4%	40.1%
Female	60.6%	59.9%
Education		
Vocational/technical school	0.3%	0%
Some college	3%	5.3%
Bachelor's degree	72.4%	72.5%
Master's degree	22.6%	21.9%
Doctor's degree	1.7%	0.3%
Identity		
Students	57.7%	48%
Professional	42.3%	52%
Tenure		
< 1	32.8%	74.2%
1–2	52.9%	25.3%
2–5	14.3%	0.3%
> 5	0%	0.2%
Level		
0–3	34.3%	39.8%
4–6	53.4%	37.7%
7–10	11.3%	20.1%
> 10	1%	2.4%

active users (Weibo Inc., 2017).

4.2. Construct measurement and operationalization

Most survey items were adapted from prior research by using the seven-point Likert scale ranging from “strongly disagree” to “strongly agree.” Specifically, self-image was measured by items adapted from Kankanhalli et al. (2005); peer influence was measured by items adapted from Santor et al. (2000); sense of belonging was measured by items adapted from Lin (2008); satisfaction was measured by items adapted from Bhattacharjee (2001b); and continuance intention and continuance use were measured by items adapted from Limayem et al. (2007). The contents and wording of each construct were modified to fit the contexts (RenRen and Weibo) of this study. The details of the survey items used in this study are listed in Appendix A.

A forward-backward translation process was employed to develop the questionnaire because most of the measurement items were originally created in English. Twenty respondents, each with more than three years of experience using RenRen and Weibo, were asked to comment on the length of the instrument, the format of the scales, the content, and the wording of the items used to measure the constructs of this study and ensure the content validity of all the measurements. Moreover, prior to the formal large-scale survey, a pilot study was conducted to ensure the reliability and validity of the instrument. Data samples were obtained from college students from a university located in China. A total of 81 RenRen respondents and 47 Weibo respondents were involved in the pilot study. The data analysis results showed that Cronbach's alphas were all above 0.7, which signifies strong internal consistency among the constructs (Nunnally & Bernstein, 1994). Based on the feedback and the comments of the respondents in the pilot tests, several questionnaire items were modified to ensure validity.

4.3. Data collection

Data collection involved two rounds. The purpose of the first round was to gather data and assess the validity of all constructs other than the actual use. A respondent driven-sampling approach was followed (Lin et al., 2014; Nunnally & Bernstein, 1994) for data collection, which

allowed respondents to refer others for participation in the survey, who in turn referred other individuals. This sampling method makes it possible to reach a large representative sample in several rounds (Heckathorn, 1997). To ensure the diversity of samples, we recruited two initial subjects, a pool of 63 students for RenRen and 67 students for Weibo who were enrolled in an undergraduate business course, as well as 55 students for RenRen and 58 students for Weibo who were enrolled in an EMBA course at a university in China. Each initial subject was asked to complete the survey and recruit three of their RenRen or Weibo friends to participate in the study. Subsequently, each of those subjects was also asked to refer their friends to participate in the survey.

Data collection in the second round, which was conducted approximately one month after first-round data gathering, mainly involved gathering data on users' continuance use behavior. A phone survey was conducted to interview the subjects using the number they voluntarily provided from the first-round survey. The subjects were also asked to provide actual answers based on information from their RenRen or Weibo accounts. Although not fully objective and ideal, this process alleviated both users' privacy concerns and self-reported subjective measure bias. Subjects who provided their mobile phone numbers and answered the two questionnaires were given a gift card as the incentive to encourage them to participate in the follow-up study.

A total of 629 RenRen and 665 Weibo respondents filled out the first questionnaire. In the second round, 594 RenRen and 608 Weibo respondents provided their mobile phone numbers and participated in the survey; however, some of them did not answer our phone call or found it inconvenient to answer the questions. A total of 579 RenRen and 585 Weibo respondents completed the two rounds of data collection. The records with missing and invalid data were excluded. Finally, the total valid sample size for RenRen was 557, and that of Weibo was 568. Table 1 presents the demographic profile of the respondents.

5. Data analysis and results

The partial least squares (PLS) technique was used to conduct data analysis. PLS is a component-based structural equation modeling technique that maximizes the variance explained by the dependent variable and does not require the multivariate normality of the data. PLS is best suited for examining complex relationships by avoiding inadmissible solutions and factor indeterminacy (Chin, 1998). Smart PLS 2.0 was chosen as the software (Chin, 1998) for data analysis. The measurement and structural models were first evaluated separately in the RenRen and Weibo contexts before cross-context comparisons were conducted.

5.1. Measurement model

Our tests were documented to validate the measurement model in Tables 1 and 2, which included tests for convergent and discriminant validity. Table 2 presents the information on descriptive statistics, CR, and AVE for all constructs in the research model. The values of AVE for both the datasets of RenRen and Weibo were all above 0.556 (Fornell & Larcker, 1981). The values of CR were higher than the recommended 0.707 (Nunnally & Bernstein, 1994) and were, therefore, all above 0.793. These findings indicate internal consistency and convergent validity.

Tables 3a and 3b lists the correlation matrix for all the constructs. Diagonals are the square root of AVEs. The item loading on their own construct was significantly higher than the cross-loading on any other construct (Tables 3a and 3b), and the value of AVE of each construct was higher than its squared correlations with any other construct. Item loading on their own construct was significantly higher than the cross-loading on any other construct (Appendix B), which indicates satisfactory discriminant validity. The aforementioned evidence suggests good measurement properties for both studies.

We took several actions to address the potential threat of common

Table 2
Descriptive statistics and reliability of constructs.

Construct	RenRen (n = 557)				Weibo (n = 568)			
	Mean	S.D.	AVE	CR	Mean	S.D.	AVE	CR
Continuance use	3.67	4.2	0.734	0.845	5.10	9.11	0.66	0.793
Continuance intention	4.91	1.21	0.806	0.925	5.40	1.04	0.817	0.930
Sense of belonging	4.25	1.27	0.746	0.921	4.27	1.23	0.744	0.920
Satisfaction	4.46	1.17	0.783	0.935	4.73	1.10	0.760	0.927
Self-image	4.13	1.09	0.663	0.907	4.14	1.08	0.703	0.921
Peer influence	4.47	1.42	0.858	0.947	4.54	1.11	0.643	0.843
Social interaction	5.15	1.07	0.580	0.873	4.84	1.08	0.734	0.917
Information sharing	5.49	1.07	0.685	0.915	5.71	0.79	0.556	0.832
Entertainment	5.21	1.11	0.773	0.911	5.42	1.09	0.808	0.926
Website quality	5.05	1.01	0.647	0.879	5.27	0.87	0.612	0.863

Note: S.D. stands for “standard deviation,” AVE denotes “average variance extracted,” and CR depicts “composite reliability.”

method bias (CMB). At the design stage of the study, the instrument contained different scale formats to reduce scale commonality (Podsakoff & Organ, 1986). At the data analysis stage of the study, we applied two statistical techniques to control CMB. First, in Harman’s single factor test, eleven factors both for RenRen and Weibo with eigen values greater than one were generated with no single factor accounting for the majority of the variance in the items. Second, we used the partial correlation method, which was performed by adding the highest factor that was produced in the principal component factor analysis into the PLS model as a control variable. The results showed that this factor did not significantly increase the variance explained by the research model for both RenRen ($\Delta R^2 = 0.000$) and Weibo ($\Delta R^2 = 0.003$), indicating no common method bias (Jarvis, Mackenzie, & Podsakoff, 2003). The above evidence collectively suggests that common method bias was not a significant issue in this study.

In addition, we further tested the non-response bias. The analysis was compared to the demographics of respondents who participated in the first round, but not in the last, and to those who participated in all two rounds of the two studies, respectively. Our findings indicated that there was no significant difference (at the 1% level) between them for both RenRen and Weibo, and hence the non-response bias has not been considered an issue here.

5.2. Structural model

Following the establishment of the measurement model, the structural model was independently tested for the RenRen and Weibo studies. Bootstrap re-sampling method was performed with 500 subsamples. The size of the sample was equivalent to that of RenRen and Weibo (n = 557 and n = 568, respectively). Fig. 2 presents the results of the analysis with satisfactory explanatory powers and estimated path

coefficients for RenRen and Weibo.

The results from Fig. 2, for RenRen and Weibo show that the structural model explained 29.6% and 21.4% of the variance in continuance use, 48.5% and 38.4% of variance in continuance intention, 61.2% and 63.3% of variance in the sense of belonging, and 63.9% and 64.2% of variance in satisfaction, respectively. The theoretical model thus offers satisfactory explanatory power in capturing the continuing use behavior of RenRen and Weibo.

From Fig. 2, we found the following: (1) Continuance intention ($\beta_{\text{RenRen}} = 0.277$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.104$, $p < 0.001$) affected user’s continuance use behavior. H1 is therefore supported. (2) Sense of belonging ($\beta_{\text{RenRen}} = 0.382$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.139$, $p < 0.001$) and satisfaction ($\beta_{\text{RenRen}} = 0.318$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.353$, $p < 0.001$) were found to positively affect user’s continuance intention. Thus, H2a and H3a are supported. (3) Out of the two appraisal constructs, self-image ($\beta_{\text{RenRen}} = 0.360$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.258$, $p < 0.001$) and peer influence ($\beta_{\text{RenRen}} = 0.297$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.408$, $p < 0.001$) had significant positive impacts on sense of belonging; self-image ($\beta_{\text{RenRen}} = 0.310$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.166$, $p < 0.001$) and peer influence ($\beta_{\text{RenRen}} = 0.191$, $p < 0.001$; $\beta_{\text{Weibo}} = 0.285$, $p < 0.001$) had significant positive impacts on satisfaction. Therefore, H4a, H5a, H6a, and H7a are all supported.

5.3. Multi-group analysis for differences between SNS and micro-blogging sites

The coefficients of individual paths between the two structural models were compared to test our hypotheses associated with different impacts. The first assessment was whether the latent constructs were perceived in a similar fashion in RenRen and Weibo. Cross loadings of measurement suggested that the loading patterns were the same, and factor loadings were highly similar. Thus, between-context path comparison is permitted. When variances are not significantly different across the groups, a *t*-test can be applied to assess statistical differences in path coefficients for each pair of paths (Carte & Russell, 2003). The Smith-Satterthwait test was also applied to evaluate the stability of these results. A Smith-Satterthwait test with pooled error term is used if the variance varies significantly across groups (Hsieh et al., 2008). The results obtained from the two tests are the same set of paths used to differentiate across contexts.

As shown in Table 4, five pairs of paths were found to be different between the contexts. (1) The relationship between users’ sense of belonging and continuance intention was stronger for the RenRen group than for the Weibo group ($t = 2.93$). Thus, H2b is supported. (2) The relationship between self-image and users’ sense of belonging was stronger for the RenRen group than for the Weibo group ($t = 2.61$). Thus, H4b is supported. (3) The relationship between self-image and user satisfaction was stronger for the RenRen group than for the Weibo group ($t = 3.75$). Thus, H5b is supported. (4) The relationship between peer influence and users’ sense of belonging was stronger for the Weibo

Table 3a
Squared pairwise correlations and assessment of discriminant validity for RenRen.

RenRen	1	2	3	4	5	6	7	8	9	10
1. Continuance use	0.856									
2. Continuance intention	0.385	0.897								
3. Sense of belonging	0.288	0.649	0.863							
4. Satisfaction	0.313	0.643	0.622	0.884						
5. Self-image	0.265	0.483	0.556	0.549	0.814					
6. Peer influence	0.312	0.537	0.509	0.554	0.424	0.926				
7. Social interaction	0.361	0.514	0.575	0.582	0.536	0.453	0.761			
8. Information sharing	0.372	0.567	0.532	0.565	0.507	0.454	0.523	0.827		
9. Entertainment	0.388	0.617	0.580	0.527	0.481	0.492	0.507	0.549	0.879	
10. Website quality	0.198	0.523	0.578	0.513	0.449	0.362	0.531	0.529	0.557	0.804

Note: Bold values in Table 3a are the square root of AVEs.

Table 3b

Squared pairwise correlations and assessment of discriminant validity for Weibo.

Weibo	1	2	3	4	5	6	7	8	9	10
1. Continuance use	0.812									
2. Continuance intention	0.373	0.904								
3. Sense of belonging	0.292	0.530	0.863							
4. Satisfaction	0.280	0.573	0.662	0.872						
5. Self-image	0.120	0.272	0.596	0.531	0.838					
6. Peer influence	0.266	0.482	0.502	0.555	0.456	0.801				
7. Social interaction	0.187	0.297	0.574	0.537	0.552	0.509	0.856			
8. Information sharing	0.295	0.540	0.571	0.512	0.399	0.517	0.509	0.745		
9. Entertainment	0.332	0.529	0.558	0.543	0.402	0.563	0.477	0.523	0.898	
10. Website quality	0.297	0.533	0.519	0.632	0.346	0.446	0.380	0.598	0.534	0.782

Note: Bold values in Table 3b are the square root of AVEs.

group than for the RenRen group ($t = 2.63$). Therefore, H6b is supported. (5) The relationship between peer influence and user satisfaction was stronger for the Weibo group than for the RenRen group ($t = 2.32$). Therefore, H7b is supported. Unexpectedly, the relationship between satisfaction and continuance intention was not stronger for the Weibo group than for the RenRen group ($t = 0.95$). Thus, H3b is not supported.

5.4. Control variables

We report the path coefficients of the control variables in Table 5. From Table 5, we found that social interaction positively affected both RenRen and Weibo users' satisfaction and sense of belonging. Information sharing was found to positively affect Weibo users' satisfaction and sense of belonging. Entertainment positively affected both RenRen and Weibo users' satisfaction and sense of belonging. Website

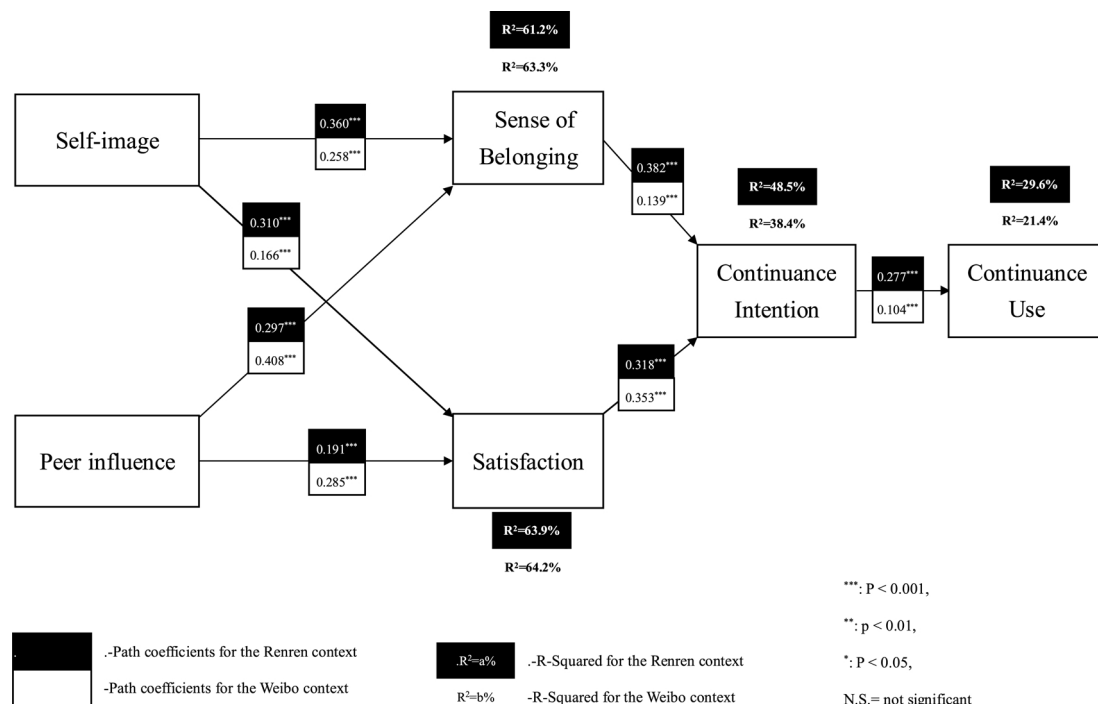
quality was found to positively affect user satisfaction.

In addition, with RenRen, we found that user classes positively affected users' continuance intention; age was found to negatively affect users' continuance use; identity and user classes were found to positively affect users' continuance use. For Weibo, we found that age negatively affected users' continuance intention; education and user classes positively affected users' continuance intention; age and identity were found to negatively affect users' continuance use; education and user classes positively affected users' continuance use.

6. Discussion and implications

6.1. Discussion of the findings

Drawing from the self-regulation framework, we developed a research model of social media continuance use and tested it based on



Note: The control variables used in Figure. 1 are not reported here for reasons of clarity and presentation.

Fig. 2. Structural Model Result.

Table 4
Path comparison.

Path	Renren	V.S.	Weibo	T test	Hypotheses test Result
H2b: Sense of belonging→ continuance intention	0.382(0.0438) ^{***}	>	0.139(0.0536) ^{***}	2.93 ^{***}	H2b supported
H3b: Satisfaction→ continuance intention	0.318(0.0471) ^{***}	<	0.353(0.0540) ^{***}	0.95 _{n.s.}	H3b not supported
H4b: self-image→ sense of belonging	0.360(0.0286) ^{***}	>	0.258(0.0261) ^{***}	2.61 ^{***}	H4b supported
H5b: self-image→ satisfaction	0.310(0.0276) ^{***}	>	0.166(0.0263) ^{***}	3.75 ^{***}	H5b supported
H6b: Peer influence→ sense of belonging	0.297(0.0304) ^{***}	<	0.408(0.0287) ^{***}	2.63 ^{***}	H6b supported
H7b: Peer influence→ Satisfaction	0.191(0.0305) ^{***}	<	0.285(0.0284) ^{***}	2.32 [*]	H7b Supported

Note: Path coefficient and *T* test are significant at ^{*}P < 0.05, ^{**}P < 0.01, ^{***}P < 0.001; n.s.: Path coefficient and *T* test are not significant. One-tailed tests were performed while the direction of differences was hypothesized. Numbers in parentheses are the standard errors.

survey data with users from SNS and microblogging sites. The results of our study answer the following three questions related to social media continuance use: (1) how continuance intention affects the continuance use of social media; (2) how sense of belonging and satisfaction, as emotional responses, influence intention to use directly and differently in SNS and micro-blogging sites; (3) how self-image and peer influence function as the appraisal determinants of a sense of belonging and satisfaction and how such effects weigh differently across different types of social media. The results of the structural model answer the above three questions and offer new evidence to understand the different motivation process of social media continuance use.

Continuance intention is a significant and positive determinant of continuance use in both SNS and micro-blogging sites (H1). The data of continuance intention and use were collected separately in a two-step approach, which prevents the threat of common method variance. The results are consistent with previous studies on continuance use (Turner et al., 2010) and support such intention-behavior relationship with more up-to-date evidence.

Another important finding of this study is that satisfaction and sense of belonging are direct positive determinants of continuance intention in SNS and micro-blogging sites, as H2a and H3a are supported. Such a finding is consistent with the findings of Lin et al. (2014). Furthermore, our results show that such effects are different across SNS and micro-blogging sites. A sense of belonging has a stronger positive power on

continuance intention in SNS than in micro-blogging sites, which is supported by the results of our multi-group analysis for H2b. Interestingly, we find there is not a significant difference between the positive effect of satisfaction on continuance intention across users of SNS and micro-blogging sites as the test of multi-group analysis for comparing the different effect of H3b did not yield significant results. There are two possible explanations for this result. First, the result may be explained by our current measure of satisfaction, which captures users' overall experience of social media. Although the current measure of satisfaction has been widely used in prior literature, the differential effect of satisfaction across social media may reflect at specific types of satisfaction. We encourage future studies can develop measures to explore how different types of satisfaction may play different roles in social media contexts to capture the nuances in the effect of satisfaction. Second, another explanation for the surprising finding may the positive effect of satisfaction on Continuance use have been tested and proved in be that the differential effect of satisfaction needs to be observed at different types of continuance use of social media. As suggested by prior studies, users may prefer different activities in social media contingent on the stages of the public event (Singh et al., 2017) or the goals of participation (Jung et al., 2017). The dynamics of the activities in the continuance use of social media may cancel out the differential effect of satisfaction on continuance use of SNS and micro-blogging sites. Future studies are encouraged to look at how such dynamics may affect users'

Table 5
Path coefficient of control variables (Fig. 2).

	RenRen		Weibo	
	Satisfaction	Sense of belonging	Satisfaction	Sense of belonging
Social interaction	0.099 ^{**}	0.155 ^{***}	0.075 [*]	0.109 ^{**}
Information sharing	0.004 _{n.s.}	−0.008 _{n.s.}	0.116 ^{**}	0.154 ^{***}
Entertainment	0.196 ^{***}	0.183 ^{***}	0.144 ^{***}	0.078 [*]
Website quality	0.240 ^{***}		0.258 ^{***}	

	RenRen		Weibo	
	Continuance intention	Continuance use	Continuance intention	Continuance use
Age	0.012 _{n.s.}	−0.176 ^{***}	−0.101 [*]	−0.226 ^{***}
Tenure	−0.036 _{n.s.}	−0.021 _{n.s.}	0.004 _{n.s.}	−0.025 _{n.s.}
Gender	−0.054 _{n.s.}	−0.029 _{n.s.}	−0.058 _{n.s.}	−0.020 _{n.s.}
Identity	0.057 _{n.s.}	0.134 ^{**}	−0.066 _{n.s.}	−0.200 ^{***}
Education	0.035 _{n.s.}	0.032 _{n.s.}	0.059 [*]	0.011 ^{***}
Level	0.080 [*]	0.035 ^{***}	0.169 ^{***}	0.239 ^{***}

n.s. path coefficient and *t* test are not significant.

*** *p* < 0.001.

** *p* < 0.01.

* *p* < 0.05.

Table 6
Theoretical implications.

Enrich the concept of motivations toward social media continuance	Compared the difference between self-image and peer influence in SNS and micro-blogging sites	Compared the difference between the sense of belonging and satisfaction in SNS and micro-blogging sites
<ul style="list-style-type: none"> ✓ Introduced dual appraisal factors toward social media continuance: self-image and peer influence ✓ Introduced and tested satisfaction and sense of belonging as emotional responses, which exhibit different mediating effects on continuance intention ✓ Explained the mixed findings of self-image and peer influence by emotional responses as mediators 	<ul style="list-style-type: none"> ✓ Identified the different roles of self-image and peer influence in the SNS and micro-blogging sites ✓ Discovered that self-image yields stronger positive effects on sense of belonging and satisfaction for SNS than for micro-blogging sites ✓ Discovered that peer influence exerts a stronger positive influence on sense of belonging and satisfaction for micro-blogging sites than for SNS 	<ul style="list-style-type: none"> ✓ Sense of belonging and satisfaction yield different effects on continuance intention of SNS and micro-blogging sites ✓ Discovered that sense of belonging incurs a stronger positive effect on continuance intention for SNS than for micro-blogging sites ✓ Discovered that satisfaction incurs a stronger positive effect on continuance intention for micro-blogging sites than for SNS

continuance intention in social media.

In terms of the appraisal determinants, the results show that self-image and peer influence positively influence users' sense of belonging and satisfaction in social media, which is supported with the results of H4a, H5a, H6a, and H7a as hypothesized. The results confirm our proposal based on social presence theory that self-image and peer influence are important motivators of social media participation as a type of computer-mediated communication. Furthermore, as supported by the statistical comparison of path coefficients for H4b and H5b in the multi-group analysis, self-image is a greater determinant on a sense of belonging and satisfaction in SNS than in micro-blogging sites. The results show the positive effect of peer influence is stronger on a sense of belonging and satisfaction in micro-blogging sites than in SNS, as H6b and H7b are supported.

6.2. Implications for theory

Our research findings offer several important theoretical contributions and implications for future social media continuance studies (Table 6). First, the present study substantiates the self-regulation framework in a social media context and theorizes about the nuanced differences between SNS and micro-blogging sites. We propose self-image and peer influence from the self-oriented and other-oriented perspectives as appraisal factors and clarify their nature within the context of social media. In addition, we explain why mixed findings of the effects of self-image (Kankanhalli et al., 2005; Ma & Agarwal, 2007) and peer influence (Dermentzi et al., 2016; Ku et al., 2013) by introducing the mediating role of a sense of belonging and satisfaction. Positive self-image and peer influence motivate users to participate when they feel a strong sense of belonging and satisfaction toward a social media. If the context does not trigger users to feel these emotional responses, the effects of the appraisal factors may become insignificant even with high peer pressure and enhanced self-image.

Second, we demonstrate the different effects of self-image and peer influence between SNS and micro-blogging sites. Prior research on social media has explored what and how motivations affect the continuance intention and behavior of users generally within a single social media (Jin, 2013; Ku et al., 2013; Zhao, Stylianou, & Zheng, 2013) and does not leverage the comparison research of social media to understand the motivational process (Jansen et al., 2011; Oh & Syn, 2015). The present study fills in this research gap by discussing how the features of SNS and micro-blogging sites may lead to the difference in their motivational mechanism. The current study provides several theoretical explanations that can be applied to shape the continuance behavior of users of a specific social media, responding to the appeal of Hsieh et al.

(2008) for researchers to evaluate how the differences among individuals with different backgrounds influence IS acceptance. Future studies can join this research stream by looking at consumer behaviors of social media, such as brand co-creation activities (Kamboj, Sarmah, Gupta, & Dwivedi, 2018). Kamboj et al. (2018) found that users' motivation has an indirect effect on their engagement in co-creating values with companies in the social media, and future studies may explore how such effect may be contingent on our findings of the different motivational mechanisms of SNS and micro-blogging sites.

Third, we demonstrate the difference of sense of belonging and satisfaction for SNS and micro-blogging sites. Lin et al. (2014) introduced the sense of belonging and satisfaction as emotional factors of the social media user, that influence the continuance intention. However, Lin et al. (2014) ignored the varying roles of the sense of belonging and satisfaction for different social media contexts. We discover that sense of belonging and satisfaction yield different effects on the continuance intention of SNS and micro-blogging sites. More broadly, our study offers a more comprehensive understanding of the difference in continuance use behaviors between SNS and micro-blogging sites. Future research can build upon our research and examine how differences among users in various social media contexts may affect their continuance use. Future studies can also extend our finding of varying motivational mechanism to understand consumer behaviors in social media. For example, Shareef, Mukerji, Dwivedi, Rana, and Islam (2017) found that Facebook users attach higher advertising value when the product-related messages are created by informal peers such as their friends but feel irritated when messages are created by marketers but disseminated by the informal peers. Future studies may explore whether the effect of advertisement sources may differ across SNS and micro-blogging sites provided their differences of social ties.

6.3. Implications for practice

From a practical perspective, our findings offer several managerial implications for social media providers or companies that use social media for marketing purposes. In general, our study not only finds the motivating mechanisms of why users continue to use social media but only highlight the difference between motivating mechanisms across different types of social media sites, of which social media providers and practitioners shall consider when making marketing or design decisions.

First, we find that there is a positive effect of self-image on a sense of belonging and satisfaction, and such effect is greater for SNS users than microblogging users. It implies that SNS users are more subjected to their appraisal of reputation or positive image presented in their avatar

than micro-blogging users. Therefore, social media providers, especially for SNS sites, shall develop applications and services that support users to create and maintain a positive self-image and allow them to receive feedback to appraise and confirm their positive self-image. For example, SNS providers may improve their photo-tagging service (Dhir et al., 2018) to allow users to receive more accurate and positive feedback from their friends. Particularly, when SNS providers need to make trade-off decision for function or feature, they shall prioritize how SNS users' need for self-image can be fulfilled. Besides, social media providers can also collaborate with practitioners who decide to launch a marketing campaign in social media to design content or functions that can support the positive self-image of users, especially in SNS. For example, SNS providers can provide a customized set of emoticon, avatar or other intangible gifts (Mamonov & Benbunan-Fich, 2017) with users' favourite brands. SNS users can connect to their image with the brand with such features provided by the SNS with a greater sense of belonging and satisfaction to the social media platform and the brand, which can maximize of the benefits of both parties.

Second, social media providers, especially for micro-blogging sites, should pay attention to the important role of peer influence to retain their users as it increases a sense of belonging and satisfaction. Social media providers should encourage users to establish social ties by following the important and informative referents in the social media sites, such CEOs of large companies (Capriotti & Ruesja, 2018). Specifically, micro-blogging providers shall optimize the recommendation algorithm to improve users' experience in discovering and identifying important peers to follow. Moreover, compared with SNS providers, microblogging providers shall put more efforts in supporting users in fulfilling the users' need as a helpful source to catch up trending topics. The effect of peer influence, though is less strong in SNS compared with micro-blogging sites, is still an important appraisal factor of users. For SNS where users maintain the bi-directional network, SNS providers shall allow users to build a private social network with referents with the highlight of effective interaction to fulfill their need for peer influence. For example, such concern can be addressed by reducing users' privacy concern in activities such as gift-giving (Mamonov & Benbunan-Fich, 2017).

Third, our findings show that a sense of belonging and satisfaction have direct positive effects on social media user' continuance intention, and such effects are contingent on the type of social media sites. Moreover, the effect of sense of belonging on continuance intention is stronger in SNS than in micro-blogging sites. It implies that SNS providers should focus on designing mechanisms to encourage their users to develop stronger attachment toward the SNS. Also, such finding also suggests when considering social media users as consumers to evaluate potential marketing opportunity in different marketing activities such as promoting brands, customer relationship, and electronic word-of-mouth (Alalwan, Rana, Dwivedi, & Algharabat, 2017) or industries such as education, music or banking (Dwivedi et al., 2015), companies should take the type of social media into account. For example, companies may prefer to choose SNS to launch a marketing campaign to promote the electronic word-of-mouth in social media while building a sense of belonging toward the brand community in the SNS. However,

we do not find the differential effect of satisfaction across SNS and micro-blogging sites, which implies that both SNS and microblogging providers should avoid inducing the dissatisfactory experience of their users.

6.4. Limitations and future research

There are some limitations in the present study that may offer potentials for future research. First, the present study examines continuance use of social media in general but does not differentiate the types of continuance activities, such as browsing posts, posting messages, sharing photos, and announcing events (Jung et al., 2017; Li, Hsieh, & Rai, 2013). Future research can extend our research model to explore how the types of user continuance activities are motivated differently across SNS and micro-blogging sites. Second, we tested our model using data from the social media in China. Though our finding can be generalized to other social media settings other than RenRen and Weibo as they have much in common with social media in other countries in terms of motivations, social ties and types of information disseminated, some nuanced differences in culture may create some differences and require future research. For example, future studies may look at how individualism-collectivism (Zhang, Lowry, Zhou, & Fu, 2007) may affect users' understanding of peer influence or self-image. Chinese users may tend to orient their self-image with collectivism whereas users of individualism culture may construct self-image in another way. Lastly, we employed a respondent-driven sampling approach to collect our subject data. Most of our sample are young adults with higher education, who may be technologically savvy with more online experience. It may not be possible to generalize our finding to users with less IT expertise or senior netizens. Future studies may look further at the different use patterns of senior citizens to see if they have different social or informational needs on social media as this aging population grows.

7. Conclusion

Drawing upon the self-regulation framework, we propose a behavioral model for social media continuance and find the differences in motivational mechanism in SNS and micro-blogging sites. The findings of our study indicate significant differences in the role of self-image and peer influence and the effects of the sense of belonging and satisfaction in SNS and micro-blogging sites. To sum up, the results of this study could assist social media providers in implementing effective interventions to enhance user experience.

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Appendix A. Sample measures

See [Table A1](#).

Table A1
Sample measures for RenRen/Weibo.

RenRen/Weibo	Items
Self-image (Adapted from Kankanhalli et al., 2005)	<ol style="list-style-type: none"> 1. Using RenRen/Weibo improves my image within the circle of friends. 2. People in my circle of friends who use RenRen/ Weibo have more prestige than those who do not. 3. Using RenRen/Weibo improves others' recognition of me. 4. When I use RenRen/Weibo, the people in my circle of friends respect me. 5. When I use RenRen/Weibo, my friends praise me.
Peer Influence (Adapted from Santor et al., 2000)	<ol style="list-style-type: none"> 1. Some members in the social network of RenRen/Weibo could push me into continuing to use RenRen/Weibo. 2. At times, I've used RenRen/Weibo because some members have encouraged me to. 3. At times, I've felt pressured to use RenRen/Weibo, because some members have urged me too.
Sense of Belonging (Adapted from Lin, 2008)	<ol style="list-style-type: none"> 1. I feel a strong sense of belonging to the RenRen/Weibo community. 2. I enjoy being a member of theRenRen/Weibo community. 3. I am very committed to the RenRen/Weibo community. 4. Overall, the virtual community has a high level of morale.
Satisfaction (Bhattacharjee, 2001b)	<p>How do you feel about your overall experience in using RenRen/Weibo?</p> <ol style="list-style-type: none"> 1. From dissatisfied to satisfied 2. From displeased to pleased 3. From frustrated to contented 4. From terrible to delighted
Continuance Intention (Limayem et al., 2007)	<ol style="list-style-type: none"> 1. I intend to continue using RenRen/Weibo. 2. I am motivated to continue to use RenRen/Weibo rather than any alternative technology/SNS. 3. If I could, I would like to continue to use RenRen/Weibo.
Continuance Use (Limayem et al., 2007)	<ol style="list-style-type: none"> 1. How often did you use RenRen/Weibo in the last seven days? 2. How many hours did you use the RenRen/Weibo in the last seven days?
Social Interaction (Adapted from Chen, 2007)	<ol style="list-style-type: none"> 1. To keep in touch with my old friends on RenRen. 2. To keep in touch with my current friends on RenRen. 3. To meet some people who are my friends' friends on RenRen. 4. To find my old friends whom I lost contact with on RenRen. 5. To maintain social ties with my friends on RenRen.
Information Sharing (Adapted from Ellison et al., 2006 ; Shi et al., 2010)	<ol style="list-style-type: none"> 1. To interact with celebrities on Weibo. 2. To know new people and make friends with them on Weibo. 3. To keep in touch with others on Weibo. 4. To expand the scope of my interpersonal relationship on Weibo.
	<ol style="list-style-type: none"> 1. To keep myself informed about the activities (e.g., status, photos, events and other information) of my friends on RenRen. 2. To find out about the things going on at my school/workplace on RenRen. 3. To find out the latest fashion trends so I can be up-to-date. 4. To post something about my recent activities (e.g., status, photos, events and other information) on RenRen. 5. To post or forward some useful information through my RenRen account.
Entertainment (Ellison et al., 2006 ; Shi et al., 2010)	<ol style="list-style-type: none"> 1. To read news on Weibo. 2. To keep me updated on current affairs on Weibo. 3. To disperse news on Weibo. 4. I believe that Weibo is a valid means of disseminating news.
Website Quality (Adapted from Lin, 2008)	<ol style="list-style-type: none"> 1. I use RenRen/Weibo to fill my leisure time. 2. I use RenRen/Weibo to have fun. 3. I useRenRen/Weibo to take a break from my homework or work.
	<ol style="list-style-type: none"> 1. I can easily navigate between pages on RenRen/Weibo. 2. RenRen/Weibo operates reliably. 3. The pages on RenRen/Weibo are well-formatted. 4. RenRen/Weibo provides various features for me to interact with others.

Appendix B. Item-factor loadings and sample cross-loading

See Tables B1 and B2.

Table B1
Item-factor loadings and sample cross-loading for RenRen.

RenRen		CU	CI	SOB	SAT	IMA	PI	SI	IS	EN	WQ
Continuance	CU1	0.926	0.371	0.264	0.291	0.240	0.282	0.351	0.360	0.367	0.217
Use (CU)	CU2	0.782	0.277	0.230	0.243	0.218	0.256	0.256	0.266	0.291	0.100
Continuance	CI1	0.379	0.931	0.547	0.559	0.410	0.488	0.462	0.526	0.568	0.463
Intention (CI)	CI2	0.285	0.832	0.621	0.587	0.449	0.466	0.448	0.468	0.512	0.452
	CI3	0.370	0.925	0.580	0.584	0.441	0.49	0.474	0.5	0.578	0.492
Sense of	SOB1	0.257	0.568	0.895	0.689	0.553	0.525	0.462	0.409	0.483	0.518
Belonging	SOB2	0.198	0.505	0.875	0.659	0.583	0.494	0.452	0.369	0.443	0.465
(SOB)	SOB3	0.304	0.583	0.835	0.602	0.527	0.505	0.500	0.513	0.517	0.478
	SOB4	0.234	0.582	0.849	0.714	0.603	0.577	0.564	0.536	0.555	0.532
	SAT1	0.309	0.611	0.645	0.886	0.545	0.479	0.559	0.545	0.568	0.625
Satisfaction	SAT2	0.254	0.586	0.716	0.926	0.603	0.494	0.505	0.498	0.560	0.542
(SAT)	SAT3	0.240	0.480	0.696	0.831	0.575	0.452	0.452	0.406	0.496	0.455
	SAT4	0.302	0.590	0.684	0.894	0.578	0.534	0.539	0.541	0.593	0.540
	IMA1	0.238	0.360	0.490	0.493	0.762	0.280	0.480	0.421	0.384	0.356
Self-image	IMA2	0.191	0.334	0.485	0.490	0.734	0.314	0.321	0.334	0.313	0.299
(IMA)	IMA3	0.241	0.407	0.565	0.564	0.882	0.366	0.473	0.465	0.428	0.394
	IMA4	0.236	0.433	0.573	0.572	0.896	0.370	0.475	0.450	0.410	0.402
	IMA5	0.175	0.426	0.554	0.519	0.786	0.390	0.428	0.389	0.416	0.372
Peer	IMI1	0.275	0.497	0.577	0.517	0.400	0.946	0.410	0.416	0.462	0.346
Influence (PI)	IMI2	0.300	0.525	0.567	0.529	0.401	0.943	0.450	0.473	0.484	0.361
	IMI3	0.294	0.470	0.550	0.494	0.379	0.889	0.401	0.371	0.422	0.300
	SI1	0.201	0.380	0.392	0.423	0.393	0.287	0.796	0.487	0.384	0.405
Social	SI2	0.364	0.412	0.439	0.457	0.415	0.389	0.835	0.560	0.435	0.434
Interaction	SI3	0.232	0.337	0.487	0.418	0.381	0.364	0.671	0.378	0.301	0.360
(SI)	SI4	0.230	0.351	0.322	0.370	0.273	0.301	0.681	0.474	0.378	0.371
	SI5	0.327	0.464	0.513	0.524	0.534	0.371	0.811	0.483	0.430	0.445
	IS1	0.322	0.466	0.366	0.430	0.354	0.389	0.483	0.804	0.544	0.430
Information	IS2	0.292	0.410	0.433	0.448	0.387	0.373	0.476	0.821	0.489	0.413
Sharing (IS)	IS3	0.328	0.504	0.476	0.526	0.460	0.419	0.533	0.849	0.547	0.443
	IS4	0.288	0.477	0.477	0.469	0.456	0.357	0.557	0.842	0.538	0.454
	IS5	0.313	0.487	0.440	0.458	0.432	0.342	0.528	0.822	0.569	0.450
Entertainment	EN 1	0.323	0.453	0.414	0.476	0.347	0.397	0.399	0.531	0.846	0.426
(EN)	EN 2	0.371	0.599	0.607	0.620	0.483	0.490	0.503	0.596	0.907	0.519
	EN 3	0.325	0.559	0.485	0.543	0.422	0.402	0.424	0.581	0.885	0.516
	WQ1	0.172	0.335	0.358	0.375	0.280	0.222	0.410	0.427	0.428	0.774
Website	WQ2	0.135	0.420	0.481	0.510	0.345	0.286	0.378	0.297	0.363	0.770
Quality (WQ)	WQ3	0.113	0.429	0.491	0.510	0.377	0.281	0.373	0.408	0.436	0.861
	WQ4	0.218	0.477	0.503	0.547	0.421	0.357	0.540	0.564	0.555	0.811

Table B2
Item-factor loadings and sample cross-loading for Weibo.

Weibo		CU	CI	SOB	SAT	IMA	PI	SI	IS	EN	WQ
Continuance use (CU)	CU1	0.885	0.343	0.231	0.225	0.065	0.217	0.132	0.267	0.299	0.267
	CU2	0.733	0.256	0.256	0.239	0.148	0.224	0.187	0.209	0.236	0.213
Continuance Intention (CI)	CI1	0.335	0.915	0.505	0.550	0.246	0.475	0.309	0.510	0.535	0.507
	CI2	0.322	0.872	0.464	0.467	0.255	0.432	0.210	0.477	0.441	0.433
	CI3	0.356	0.925	0.469	0.535	0.239	0.402	0.285	0.480	0.459	0.504
Sense of Belonging (SOB)	SOB1	0.242	0.427	0.873	0.665	0.508	0.608	0.493	0.467	0.462	0.432
	SOB2	0.324	0.491	0.911	0.713	0.547	0.642	0.512	0.525	0.514	0.467
	SOB3	0.296	0.502	0.878	0.661	0.494	0.591	0.480	0.536	0.515	0.484
	SOB4	0.136	0.404	0.785	0.626	0.510	0.582	0.498	0.439	0.434	0.408
Satisfaction (SAT)	SAT1	0.300	0.568	0.636	0.868	0.410	0.571	0.443	0.598	0.608	0.623
	SAT2	0.249	0.515	0.698	0.931	0.483	0.589	0.481	0.532	0.572	0.562
	SAT3	0.153	0.388	0.708	0.828	0.541	0.550	0.478	0.458	0.447	0.447
	SAT4	0.261	0.513	0.664	0.860	0.437	0.576	0.479	0.538	0.600	0.556
Self-image (IMA)	IMA1	0.064	0.176	0.441	0.381	0.770	0.335	0.425	0.311	0.289	0.241
	IMA2	0.100	0.211	0.529	0.459	0.800	0.410	0.413	0.315	0.322	0.297
	IMA3	0.084	0.231	0.461	0.429	0.884	0.362	0.459	0.353	0.351	0.301
	IMA4	0.141	0.233	0.508	0.459	0.895	0.371	0.499	0.342	0.342	0.312
	IMA5	0.107	0.279	0.545	0.484	0.837	0.422	0.511	0.351	0.375	0.293
Peer Influence (PI)	IMI1	0.183	0.323	0.615	0.511	0.406	0.831	0.439	0.361	0.374	0.304
	IMI2	0.287	0.480	0.597	0.597	0.363	0.853	0.442	0.466	0.544	0.429
	IMI3	0.161	0.352	0.468	0.461	0.327	0.715	0.336	0.423	0.438	0.338
Social Interaction (SI)	SI1	0.264	0.336	0.488	0.477	0.455	0.465	0.822	0.498	0.464	0.372
	SI2	0.098	0.213	0.484	0.448	0.442	0.396	0.850	0.412	0.373	0.298
	SI3	0.160	0.251	0.469	0.444	0.509	0.430	0.876	0.434	0.411	0.311
	SI4	0.120	0.220	0.524	0.473	0.488	0.452	0.880	0.404	0.390	0.321
Information Sharing (IS)	IS1	0.205	0.351	0.343	0.345	0.290	0.324	0.329	0.652	0.374	0.350
	IS2	0.206	0.419	0.443	0.451	0.354	0.373	0.431	0.779	0.485	0.471
	IS3	0.237	0.363	0.342	0.416	0.211	0.310	0.265	0.694	0.435	0.418
	IS4	0.239	0.466	0.539	0.576	0.329	0.502	0.466	0.843	0.544	0.524
Entertainment (EN)	EN 1	0.286	0.425	0.399	0.484	0.325	0.430	0.376	0.506	0.869	0.519
	EN 2	0.320	0.518	0.582	0.653	0.423	0.561	0.474	0.608	0.921	0.614
	EN 3	0.288	0.475	0.501	0.575	0.326	0.513	0.426	0.555	0.907	0.567
	WQ1	0.247	0.426	0.400	0.502	0.227	0.378	0.313	0.494	0.565	0.820
Website Quality (WQ)	WQ2	0.266	0.472	0.406	0.491	0.216	0.351	0.296	0.477	0.512	0.843
	WQ3	0.126	0.341	0.413	0.492	0.333	0.289	0.235	0.382	0.350	0.732
	WQ4	0.290	0.429	0.405	0.491	0.307	0.375	0.346	0.516	0.552	0.729

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