EXPLORING THE EFFECTS OF SENSE OF MEMBERSHIP ON INFORMATION SHARING IN VIRTUAL COMMUNITIES

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ABSTRACT

A virtual community (VC) is a cyberspace in which members exchange information for mutual benefit in terms of learning and problem-solving. Drawing upon and extending the theory of uses and gratifications (U&G), this study proposes a research model that integrates U&G with the sense of membership (SOM) to explore their effects on individuals' information-sharing intentions. 1,280 valid responses were collected from six Chinese information exchange VCs through an online survey. The results show that anticipative reputation, vertical relationship, horizontal relationship, reciprocity, enjoyment gratification, and SOM can directly affect individuals' information-sharing intentions. Additionally, SOM moderates the effects of anticipative reputation, vertical relationship, horizontal relationship, relative advantage, and enjoyment. These findings highlight the importance of SOM for moderating information-sharing tendencies not only for researchers but also for practitioners of VCs. Our extended U&G model could serve as a valuable theoretical foundation for future studies to gain a fine-tuned understanding of information-sharing decisions in VC contexts.

Keywords: Information sharing intention; Uses and gratifications; Virtual community; Sense of membership

1. Introduction

The rapid advancement of information technologies has enabled Internet users to exchange a variety of information online (Lin & Wang, 2020). People have grown accustomed to accessing information online to solve problems in work, study, or daily life. This has prompted the popularity of information-sharing virtual communities (VCs), which encourage users to exchange information for mutual learning. Quora, a leading information-sharing VC for English-speaking countries, had more than 4 million unique daily visitors on average in December 2020. Likewise, Zhihu, a popular Chinese information-sharing VC, attained an average of 25 million unique daily visitors in the same

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period.¹ The survival and flourishing of information-sharing VCs depend on the quantity and quality of the information being shared (Chen & Hung, 2010); consequently, exploring the primary factors that motivate Internet users to share information is a key research topic in the information systems (IS) domain (Liu et al., 2016).

Various studies (Bock et al., 2005; Chang & Chuang, 2011; Herrero et al., 2017; Hwang et al., 2018; Kankanhalli et al., 2005; Lin & Wang, 2020; Wasko & Faraj, 2005; Zhang et al., 2019) have been undertaken to investigate the determinants of information-sharing behaviors from different theoretical perspectives. They have identified several critical motivational factors, including social, utilitarian, and hedonic predictors, among others. These factors can be properly explained through the lens of uses and gratifications (U&G) theory (Katz, 1959). This theory considers that the gratification of social and psychological needs can motivate individuals to participate in a particular social media (Gan & Li, 2018; Li et al., 2015). Besides, previous research further considers that sense of membership (SOM) may directly affect people's information-sharing behaviors (Sutanto et al., 2011). SOM is the sense of having invested oneself as a member of a community, thus belonging to it (Aronson & Mills, 1959). In a community, SOM is cultivated by member interactions (Blanchard, 2008) and reflects members' emotional attachments to a given community (McMillan & Chavis, 1986). Commonly, Individuals who frequently visit an information-sharing VC possess high SOM, whereas people who first time or seldom visit it holds a low SOM perception (Luo et al., 2015).

The development and prosperity of information-sharing VCs are not only dependent upon the knowledge contribution from high-SOM members but also from low-SOM users. Without the contribution and participation of the low-SOM users (such as newcomers), the VCs cannot expand the scope of the published knowledge, especially that existing high-SOM members lack. Besides, encouraging newcomers to contribute their knowledge, in the long term, may also increase the scale of active users of the VCs and finally improve their business performance. However, the effects of motivational factors on different users' information-sharing behaviors are still not clear. The impact of these factors may vary with different levels of SOM, as McMillan & Chavis (1986) propose that SOM may modify the cognitive styles of community members. Subsequent research (Hsu & Liao, 2014; Luo et al., 2015) has empirically supported such moderating role in a myriad of research contexts. Nonetheless, according to our best knowledge, previous research has not investigated the moderating role of SOM in an information-sharing context. This study endeavors to fill this research gap by introducing SOM into the information-sharing domain as a moderator. In general, this study employs U&G theory as the focal framework for identifying the motivational factors of information-sharing intentions and further extends U&G by accounting for the moderating effects of SOM. The research question of this study is as follows:

RQ: Will SOM moderate the effects of motivational factors on VC members' information-sharing intentions?

We believe that exploring the above research question is important from both theoretical and practical perspectives. From a theoretical perspective, the empirical findings unveil the influencing mechanisms of different gratification factors for VC members with varying SOM; thus, IS scholars can gain a deeper understanding of these factors' role in different VC members' cognition and behavior. From a practical standpoint, as information-sharing VC practitioners must encourage a large number of members to share their knowledge, it is crucial for them to fully comprehend the key motivators for both high-SOM and low-SOM users. As a result, the objective of this study is to unravel and resolve this conundrum. The empirical findings of this study will shed light on how VC practitioners can implement different and precise information technologies and management strategies for both high and low-SOM users to stimulate their information-sharing intentions, hence promoting the prosperity of information exchange VCs.

The rest of this paper is organized as follows: first, it will provide an overview of the literature on information sharing before introducing the concepts of U&G theory and SOM. Next, the research model and hypotheses will be presented, followed by the research methodology describing the data collection process and statistical analysis results. Finally, we will discuss the findings, describe their theoretical and practical implications, and acknowledge the limitations of this study.

2. Literature Review and Theoretical Foundations

2.1. Information Sharing Literature Review

Information sharing has been an important topic in IS research over the past two decades (Sambamurthy and Subramani, 2005). Several scholars have made substantial contributions to this research domain and have identified a number of independent variables and moderators that may affect Internet users' sharing intentions and behaviors. The typical theoretical foundations in this research field include social capital theory, social exchange theory, social cognitive theory, theory of planned behavior, attribution theory (Bock et al., 2005; Chang & Chuang, 2011; Herrero et al., 2017; Hwang et al., 2018; Kankanhalli et al., 2005; Lin & Wang, 2020; Wasko & Faraj, 2005; Zhang et al., 2019), and so on. For instance, Kankanhalli et al. (2005) utilize social exchange theory and social capital theory as

¹ http://www.alexa.cn/rank

their theoretical foundation to explore the loss of knowledge power, codification effort, organizational reward, image, reciprocity, knowledge self-efficacy, and enjoyment in helping others' effects on information-sharing intention. They also include pro-sharing norms, generalized trust, and identification as moderators in the research model. This study empirically confirms that knowledge self-efficacy and enjoyment in helping others have significant effects, and generalized trust could moderate the codification effort' effect on information-sharing intention. Besides, pro-sharing norms also moderate the effect of reciprocity. Based upon social cognitive theory, Lin et al. (2009) investigate the norm of reciprocity, trust, knowledge-sharing self-efficacy, perceived relative advantage, and perceived compatibility's effects on knowledge-sharing intention. They confirm the importance of each of these factors. Drawing on attribution theory and theory of planned behavior, Zhao et al. (2016) investigate the effects of enjoyment in helping others and knowledge self-efficacy on attitude toward information sharing. They propose that virtual organizational reward and reciprocity could moderate the above causal relationships. They discover that, while the independent variables have no direct impacts, all of the moderating regression effects are significant in empirical analyses.

Previous research has also examined the effect of SOM (also called sense of belonging) in individuals' information-sharing process. Qu & Lee (2011), for example, find it exerts a crucial effect on members' information-sharing intention in travel VC. Similarly, Zhao et al. (2012) discover that it could significantly affect individuals' intention to share information on Taobao VC in China. In general, IS scholars have investigated the impact factors that could motivate Internet users' sharing behaviors from various theoretical perspectives in different types of online research contexts. Although many of them have recognized that Internet users exchange information in the context of VCs, they merely examine SOM's direct effect. This study thus endeavors to explore its moderating effects within information-sharing VCs.

2.2. Uses and Gratifications Theory

U&G theory is first proposed by Katz and further developed in radio communication research (Katz, 1959). It transfers the approach to mass media research from "What do the media do to people?" to "What do people do with the media?" (Huang & Chang, 2020). U&G theory attempts to explain which social and psychological needs can motivate individuals to select and participate in a particular media platform (Gan & Li, 2018; Li et al., 2015; Lyu and Kim-Vick, 2022). It considers people as goal-oriented with their needs giving rise to their motivations, which further affect their use of communication media and determine their cognition and behavior (Katz et al., 1974). It offers a nomological research framework without providing a predefined set of constructs.

Early U&G studies consider two types of motivation related to individuals' media usage: content gratification and process gratification (Cutler & Danowski, 1980). Content gratification derives from the use of messages carried by the media, while process gratification represents the enjoyment derived from the actual use of the media (Stafford & Stafford, 2001). With the popularization of the Internet, this theory has been widely embraced in various online research contexts, and scholars use it to classify motivational factors influencing people's attitudes and behaviors. IS research typically identifies three dimensions of user motivation: utilitarian, hedonic, and social gratification (Li et al., 2015; Salehan et al., 2017). Utilitarian gratification refers to the utility of using media for a goal-oriented task; hedonic gratification entails various social benefits resulting from establishing and maintaining social interactions with others through media usage. Some scholars (Nambisan & Baron, 2009) further propose a 4th dimension, i.e., personal integrative gratification, and define it as the benefits related to strengthening the credibility, status, and confidence of a person. In the context of information-sharing VCs, we posit that personal integrative gratification has an overlapping content domain with social gratification as these personal benefits can be achieved through social interactions.

U&G theory has been widely applied in IS studies to understand Internet users' media usage intentions or behaviors (Huang & Chang, 2020). These prior studies have highlighted the significant roles of various gratifications on user participation in different types of Internet media. For instance, Xu et al. (2012) examine the effects of utilitarian and social gratification on those using social networking sites (SNSs) and discover that immediate access, coordination, affection, and leisure are positive predictors. Kaur et al. (2020) utilize U&G theory as their theoretical foundation to investigate the impact factors of virtual goods purchases and continuation intentions, and they find the significant effects of entertainment, exposure, and affection. Scholars also have applied this theory to information-sharing contexts to identify the crucial antecedents of information-sharing behaviors or intentions. For example, Lee & Ma (2012) empirically discover that information seeking, socializing, entertainment, status seeking, and prior social media sharing experience exert significant effects on the intention to share news. Salehan et al. (2017) reveal that utilitarian, hedonic, vertical, and horizontal social gratifications can significantly affect users' information-sharing and collaboration intentions on SNSs, such as Facebook, Twitter, and Cyworld, among others. Following this line of research, this study will employ U&G theory to identify and classify the predictors of information-sharing intentions. This theory is appropriate for explaining the motivations behind users' voluntary information-sharing behaviors in the context of VCs (Lee & Ma, 2012), as information-sharing intentions result from various types of needs being gratified.

2.3. Sense of Membership in the Virtual Community

A community is a social entity characterized by relational interactions and by the social ties that draw people together (Heller, 1989; McMillan & Chavis, 1986; Tönnies, 1955). Gusfield (1975) distinguishes two types of communities. The first is a geographic community, which is physically contained within a neighborhood, town, or city. The second type concerns relationships that are not location-based but are formed based on common hobbies and interests. Either way, communities have distinct boundaries that help members separate "us" from "them" and provide members with perceived emotional safety, which fulfills their needs (Ehrlich & Graeven, 1971; McMillan & Chavis, 1986).

With the development of Web 2.0, many VCs have emerged and united physically separate Internet users in cyberspace (Koh & Kim, 2003-4). A VC has four components: people, a shared purpose, policies, and computer systems (Preece, 2000). Users share information voluntarily in a VC for the sake of learning or problem-solving (Lechner & Hummel, 2002), and their sharing actions are often loosely governed by social norms embedded in the VC (Han et al., 2019). Users would feel they become members of a VC and have a right to belong to that VC as a result of frequent interactions, which scholars refer to as SOM (or sense of belonging) (Hagerty et al., 1992; Luo et al., 2015; Luo et al., 2018; McMillan, 1996; Zhao et al., 2012). SOM is one's self-assessment of community belonging and the feeling of having been accepted by other community members. SOM is the principal component of a related concept called sense of community (Keng et al., 2015; McMillan & Chavis, 1986). In comparison with SOM, sense of community is a broader multi-dimensional concept, consisting of SOM as well as other elements. Some scholars argue that it has four elements (i.e., SOM, influence, integration and fulfillment of needs, and shared emotional connection) (McMillan & Chavis, 1986) while others consider it to have three elements (i.e., SOM, influence, and immersion) (Koh & Kim, 2003-4). In this study, we focus on SOM instead of all elements of sense of community to gain a fine-grained understanding of both the direct and moderating effects of SOM.

Various IS studies have reported that SOM can affect Internet users' cognition and behavior in VCs. For instance, Kim et al. (2004) find that SOM could significantly affect not only members' loyalty, but also their travel product purchase behaviors in online travel communities. Luo et al. (2017) also demonstrate that SOM has a significant effect on MOOC students' stickiness in an e-learning environment. Beyond considering SOM as a direct predictor, some scholars also treat it as a moderator in other research contexts. For example, Hsu & Liao (2014) discover that SOM serves as the moderator to alter the effect of perceived information accessibility on the stickiness of microblogs. Luo et al. (2015) also outline empirical evidence to suggest that SOM could moderate the relationships between the antecedent factors and perceptions of information credibility. Inspired by the theoretical underpinning of SOM and the guidance of previous empirical studies, this research posits that SOM exerts both direct and moderating effects on VC members' information-sharing intentions. The following section will describe our hypothesis development and how we formulate the research model.

3. Hypothesis Development and Research Model

This research utilizes U&G theory to build the research model. We classify the predictors of information sharing as social, utilitarian, or hedonic gratifications. Specifically, based on our literature review of this theory and interviews with 20 information-sharing VC members, the six most mentioned gratification factors are selected as the independent variables in the research model. We also conjecture that SOM will not only directly affect VC members' sharing intentions, but also modify the effects of the three types of gratification. The full research model is presented in Figure 1.



Figure 1: Research Model

3.1. Social Gratification

Information sharing in VCs cannot be forced by others; it can only be encouraged if individual needs have been gratified (Chang & Chuang, 2011). Social gratification factors are important motivators that can facilitate individuals' information-sharing behaviors (Salehan et al., 2017). Social gratification includes various kinds of social benefits, and expected reputation building has been recognized as an essential social benefit of participation in a VC (Liu et al., 2016; Wasko & Faraj, 2005). Information contributors can receive recognition as experts by sharing valuable information with others; during this process, they build a high reputation (Ba et al., 2001; Kankanhalli et al., 2005). Thus, we predict that establishing and enhancing reputation is an important motivator that stimulates individuals to share information in VCs.

H1a: Anticipative reputation has a positive effect on information-sharing intentions in VCs.

Social relationships define the strength and scope of individuals' social ties with other VC users and help people get to know others better (Lin & Wang, 2020). Establishing and strengthening social relationships have been regarded as an important form of social gratification that individuals seek in VCs (Gan & Li, 2018). Salehan et al. (2017) further classify the anticipative social relationships as either vertical or horizontal. Anticipative vertical relationships concern maintaining and strengthening existing intimate social relationships with acquaintances, while anticipative horizontal relationships refer to extending one's network of friends with strangers (Valenzuela et al., 2009). Extending and strengthening social relationships have repeatedly been posited as the significant predictor for motivating individual participation in various types of ISs, including online games (Li et al., 2015), SNSs (Salehan et al., 2017), instant messengers (Gan & Li, 2018), and others. Following previous research, this study posits that both anticipative vertical and horizontal relationships affect individuals' information-sharing intentions:

H2a: Anticipative vertical relationship has a positive effect on information-sharing intentions in VCs.

H3a: Anticipative horizontal relationship has a positive effect on information-sharing intentions in VCs.

Blau (1964) defines reciprocity as "actions that are contingent on rewarding reactions from others and that cease when these expected reactions are not forthcoming." It is a sense of mutual indebtedness that indicates current information-sharing behaviors will lead to future information returns by other VC members (Wasko & Faraj, 2005).

It should be noted that reciprocal relationships seldom occur between two members in the VC; instead, they are in a generalized form and depend on all the VC members' information-sharing behaviors (Han et al., 2019). Information contributors who foresee reciprocal relationships would perceive that their needs will be gratified by the information-sharing behaviors of others; thus, making anticipative reciprocity a crucial social benefit of the information exchange process (Cheung & Lee, 2012; Lai & Chen, 2014). As anticipative reciprocity has been shown to stimulate individual information-sharing intentions and behaviors (e.g., Chiu et al., 2006; Hau et al., 2013; Liu et al., 2016), this research suggests the following hypothesis:

H4a: Anticipative reciprocity has a positive effect on information-sharing intentions in VCs. 3.2. Utilitarian Gratification

Utilitarian gratification is another type of benefit that individuals obtain by participating on social media platforms (Gan & Li, 2018; Huang & Zhou, 2018). Previous research considers anticipative relative advantage as a typical utilitarian benefit and defines it as the degree to which an innovative IS is expected to be better than its precursor (Li et al., 2015; Moore & Benbasat, 1991). Subsequent studies have introduced the concept to the social media contexts and defined it as an individual's expected advantages and benefits acquired during the information exchange process (Chen & Hung, 2010; Lin et al., 2009). Related studies have suggested that in VCs, the anticipative relative advantages of information sharing include enriching the contributors' knowledge, improving their skills, rapidly absorbing and reacting to new information, and heightening their problem-solving efficacy (Butler, 2001; Montazemi & Qahri-Saremi, 2015). In this study, we suggest that contributors are motivated to share information if they foresee relative advantages in a VC:

H5a: Anticipative relative advantage has a positive effect on information-sharing intentions in VCs. 3.3. Hedonic Gratification

People not only require social and utilitarian benefits, but also seek hedonic gratification in social media. Hedonic gratification refers to users' pleasure-related perceptions of their VC experiences (Salehan et al., 2017). In IS literature, individuals' anticipative enjoyment has been regarded as the prominent hedonic factor that motivates their activities (Li et al., 2015). In the current study, we define it as the specific enjoyment for personal value and exclude the enjoyment for social value. As a key intrinsic psychological reward, anticipative enjoyment has been recognized as a crucial gratifying factor for enabling the success of an information system (Xu & Li, 2015). With the development of information technologies, technicians have created various types of entertainment features to help users enhance enjoyment perception in different information exchange VCs, such as, individuals may perceive enjoyment from the animation shows during the information sharing process (Salehan et al., 2017). Previous studies have found that people are more willing to use social media platforms if they perceive pleasure and enjoyment during their usage (Gallego et al., 2016; Gan & Li, 2018). Many information-sharing studies have underscored the effects of anticipative enjoyment on individuals' sharing intentions and behaviors (Hau et al., 2013; Hsu & Lin, 2008). This study thus incorporates it into the research model as a hedonic motivator:

H6a: Anticipative enjoyment has a positive effect on information-sharing intentions in VCs. 3.4. The Dual Effects of Sense of Membership

Based on U&G theory, this study has identified various gratification factors influencing information-sharing intentions. As information exchange behaviors occur in the context of VCs, we further predict that SOM serves as both a direct predictor and a moderator to affect VC members' information-sharing intention. SOM constitutes a sense of belonging to a community, which helps people view themselves as members of the community (McMillan & Chavis, 1986). People with strong SOM are more likely to be loyal to their communities and thus actively participate in them (Kim et al., 2004; McMillan, 1996). The direct relationship between SOM and the consequent VC engagement behaviors has been repeatedly proven by several empirical studies (e.g., Xu & Li, 2015; Zhao et al., 2012). Following their viewpoint, this study predicts that SOM can facilitate information contributors' sharing intentions:

H7: Sense of membership has a positive effect on information-sharing intentions in VCs.

This study further asserts that SOM moderates the relationships between various types of gratification and information-sharing intentions. Social gratification includes various social benefits from interactions with other users of information-sharing VC (Li et al., 2015; Salehan et al., 2017). High-SOM members possess a strong feeling of belonging to their VC and treat other members in the VC as their in-group friends, such that they consider themselves as part of the VC instead of detached individuals (Luo et al., 2015; McMillan & Chavis, 1986). Consequently, their actions (i.e., sharing information) may be saliently driven by acquiring social benefits from other members in the VC, this study thus submits that high-SOM information contributors' sharing intentions are heavily influenced by developing and building their reputation, establishing reciprocal relationships, and strengthening social ties with other VC members (Hsu & Liao, 2014). In this way, they can achieve a strong sense of confidence as a member and perceive themselves as being accepted by a VC (McMillan, 1996). That is to say, anticipative vertical relationships, reciprocity, and reputation play a crucial role in affecting high-SOM members' information-sharing intentions. On the contrary,

for low-SOM individuals with a weak sense of belonging in the VC, they treat themselves as detached individuals from other VC members; thus, above anticipative social benefits play a less important role in determining their behaviors within the VC. Consequently, for such individuals, the effects of anticipative reputation, reciprocity, and vertical relationships with other members on information-sharing intentions will be attenuated.

Although the anticipative horizontal relationship is one kind of social benefit individuals can obtain in information-sharing VC, we consider it may not strengthen high-SOM members' information-sharing intentions. This factor refers to extending users' network of friends with strangers. However, high-SOM members are not sure about the identities of the strangers, there is a high probability that these strangers are not active members of the VC, but temporary users or passers-by because these persons account for the majority of the users in a VC (Lai & Chen, 2014). Thus they will treat these strangers as out-group persons and behave less favorably towards them (Sia et al., 2009). They may consider the anticipative horizontal relationship as an out-group social benefit with weak social ties, consequently, its effect on their information-sharing intentions will be attenuated. Whereas for low-SOM users, as they are detached individuals in the VC, they may treat both VC members and temporary users/passers-by more equally, we predict they are more willing to embrace such a relationship, thus anticipative horizontal relationship may exert a stronger effect on their information sharing intentions, compared to high-SOM ones. This study thus proposes the following hypotheses:

H1b: The effect of anticipative reputation on information-sharing intentions is strengthened with the increase of VC members' SOM.

H2b: The effect of anticipative vertical relationship on information-sharing intentions is strengthened with the increase of VC members' SOM.

H3b: The effect of anticipative horizontal relationship on information-sharing intentions is attenuated with the increase of VC members' SOM.

H4b: The effect of anticipative reciprocity on information-sharing intentions is strengthened with the increase of VC members' SOM.

Besides adjusting the effects of social gratification, SOM may moderate the effects of utilitarian and hedonic factors on individuals' information-sharing intentions. As stated above, users with low SOM lack confidence in their belonging to the VC and are less emotionally attached to them. Thus, they are inclined to consider themselves as outgroup individuals having distant relationships with other members (McMillan, 1996; McMillan & Chavis, 1986). As outsiders, we predict their behaviors in the VCs cannot be strongly motivated by the social benefits within the VC, such as enhancing reputation, establishing reciprocal relationships, and strengthening social ties with other VC members. Their VC activity (i.e., sharing information) is more likely to be driven by personal value, such as attaining intrinsic happiness, and/or other cost-benefit analyses (Chang et al., 2020). Utilitarian gratification concerns the benefits of information sharing in a VC, while hedonic gratification makes users feel happy during the informationsharing process (Li et al., 2015; Salehan et al., 2017). These two types of gratification can be suitable motivators for encouraging low-SOM users' activities (Feng et al., 2016). We thus posit that anticipative relative advantage and enjoyment play a crucial role in stimulating low-SOM users' information-sharing intentions. If they believe they can improve their problem-solving skills or feel enjoyment for personal value during the information-sharing process, they may be willing to do so. Conversely, as social benefits within the VC are their priority, high-SOM members may not emphasize utilitarian and hedonic forms of gratification as low-SOM individuals do; consequently, the effects of anticipative relative advantage and enjoyment on high-SOM members' information-sharing intentions are not as strong as those of low-SOM individuals. We thus propose the following hypotheses:

H5b: The effect of anticipative relative advantage on information-sharing intentions is attenuated with the increase of VC members' SOM.

H6b: The effect of anticipative enjoyment on information-sharing intentions is attenuated with the increase of VC members' SOM.

4. Method

This study employed an online survey to collect data from real users of information-sharing VCs in China. China has a plethora of knowledge exchange VCs, and hundreds of millions of Chinese people are members of such VCs, making them ideal data collection locations. Online surveys are commonly used to measure psychological variables in IS research. To select the most popular VCs from which to collect data, we first formed a focus group consisting of ten graduate students majoring in electronic commerce and IS. The focus group discussion generated a list of 15 popular VCs. Following that, we conducted a preliminary survey with 60 undergraduates at a Chinese university, asking them to choose their most-used VCs from a list of 15 chosen platforms (multi-choice). The results showed that more than two-thirds of them selected six of the fifteen VCs, with the remaining nine VCs accounting for less than 40% of the students' selections. Thus, we chose to conduct an online survey in the top six VCs, including Baidu Baike

(https://baike.baidu.com), Baidu Experience (http://jingyan.baidu.com), Baidu Zhidao (https://zhidao.baidu.com), Dazhong Dianping (http://www.dianping.com), Douban (https://www.douban.com), and Zhihu (https://www.zhihu.com). We believe that field data from real users in these leading VCs will help to better validate the findings herein.

In general, the above information-sharing VCs target various domains of information exchange in people's daily lives with different forms of exchange. Baidu Baike is the leading online encyclopedia in China in which members collaboratively contribute knowledge on various topics. Baidu experience encourages experienced members to share their pragmatic skills to help people solve problems in work, study, or daily life. Baidu Zhidao is a social Q&A community where information seekers post their questions and wait for answers. Dazhong Dianping allows members to share their experiences with various types of stores, such as restaurants, Karaoke Televisions, hotels, and other establishments. Douban focuses on reviews for books, music, movies, and other literary works. Finally, Zhihu is an online VC in which members can discuss and exchange information concerning topics of interest. Collectively, we consider these six information exchange VCs as a good representation of the nature of VCs in China.

We designed six identical online questionnaires for these VCs and posted them on Sojump, a widely used professional online survey website in China. Each questionnaire included three sections. The first section provided information about the general purpose of the study, the researchers' email contacts, and the assurance of confidentiality and anonymity. The second section contained all measurement items for the constructs in the research model (see Appendix 1). All of them were adopted from previous studies and were reflective indicators on a seven-point Likert scale. As the original construct items were in English and the survey participants were Chinese VC members, we first translated the items into Chinese, then invited two IS scholars with work experience in English-speaking countries to check the translations. These items were then back-translated into English to verify the accuracy of the translations, and any differing opinions were resolved through further discussions.

Before finalizing the survey, we conducted a pilot study using a group of 23 VC users to check the clarity of the survey items. All VC users indicated no difficulty in understanding the questions. We then proceeded with main data collection, which lasted for three months and during which we employed 10 undergraduates to help us invite members of the VCs. We compensated each respondent 10 RMB (approximately 1.5 US dollars) as the reimbursement for both the pilot and the main data collection. In total, we received 1,280 usable responses. Among them, 244 were from Baidu Baike, 190 were from Baidu experience, 188 were from Baidu Zhidao, 221 were from Dazhong Dianping, 207 were from Douban, and 230 were from Zhihu. The subjects represented each of mainland China's 32 provincial-level administrative regions. The sample consisted of students, government officials, company managers, clerks, technicians, freelancers, and so on. The respondents' geographical and occupational diversity supported the representativeness of our sample. Table 1 describes other demographic characteristics of our sample.

Table 1: Sample Demographics Description								
Gender								
Male	675	52.7%						
Female	605	47.3%						
Age								
20 and below	239	18.7%						
21-25	622	48.6%						
26-30	162	12.7%						
31-35	158	12.3%						
Above 35	99	7.7%						
Education								
High school graduate and below	204	16.0%						
Bachelor's degree	890	69.5%						
Master and above	186	14.5%						
Net age (year)								
Less than 2	45	3.5%						
2-4	197	15.4%						
5-7	521	40.7%						
8-10	352	27.5%						
Above 10	165	12.9%						

Table 1: Sample Demographics Description

5. Results

In this section, we first evaluate the reliability and validity of the measurement scales for all constructs of the research model. After validating measurement instrument quality, we employ moderated multiple-regression analyses (Cohen & Cohen, 1983) to test our hypotheses.

5.1. Measurement Model Analyses

Confirmatory factor analysis (CFA) is utilized to test the measurement model. First, we assess the Composite Reliability, Average Variance Extracted (AVE), and Cronbach's Alpha for each construct. Table 2 shows that all the composite reliability values are greater than 0.8, above the corresponding threshold of 0.7 (Nunnally & Bernstein, 1994). The AVE values are above 0.7, greater than the corresponding threshold of 0.5 (Fornell & Larcker, 1981). The Cronbach's alpha values are greater than 0.8, exceeding the threshold of 0.7 (Nunnally & Bernstein, 1994). We also test the loadings and cross-loadings for all constructs. As shown in Table 3, most of the loading values are greater than the recommended ideal cutoff of 0.7, but all of them are greater than the minimum threshold of 0.5 (Hair et al., 2006). All cross-loading values are less than 0.4. These results ensure the reliability and convergent validity of our measurement model. To check discriminant validity, Fornell-Larcker and heterotrait-monotrait (HTMT) criteria are calculated. For Fornell-Larcker criterion, Table 4 demonstrates that the square roots of AVE are far greater than the cross-correlations (Fornell & Larcker, 1981). For HTMT, Table 5 shows that all the values are less than 0.85 (Henseler et al., 2015). Both Fornell-Larcker and heterotrait-monotrait (HTMT) criteria indicate the data's high discriminant validity. Variance inflation factors (VIF) are then utilized to test the extent of multicollinearity among all exogenous variables, i.e. the six gratification factors and SOM. The statistical results show that all VIF values are less than 3, suggesting that multicollinearity is not a serious problem in this study (Mansfield & Helms, 1982). To test nonresponse bias, one-way ANOVA is performed to examine the demographic homogeneity of the first 120 and the last 120 respondents. The comparisons of the mean values for demographics are all insignificant (p > 0.05), suggesting that this study has no serious non-response bias (Miller & Smith, 1983).

Construct	Item	Mean	Std.	Composite	AVE	Cronbach's
			Deviation	Reliability		Alpha
Anticipative	REPT1	4.94	1.235	0.940	0.840	0.905
reputation (REPT)	REPT2	4.83	1.229			
	REPT3	4.95	1.218			
Anticipative vertical	VTRL1	5.12	1.062	0.931	0.818	0.888
relationship (VTRL)	VTRL2	5.14	1.111			
	VTRL3	5.33	1.098			
Anticipative	HZRL1	5.27	1.199	0.933	0.823	0.892
horizontal	HZRL2	5.17	1.228			
relationship (HZRL)	HZRL3	5.43	1.235			
Anticipative	RECP1	5.43	1.082	0.915	0.728	0.875
reciprocity (RECP)	RECP2	4.99	1.220			
	RECP3	5.52	1.067			
	RECP4	5.34	1.055			
Anticipative relative	RLAD1	5.31	1.146	0.897	0.744	0.829
advantage (RLAD)	RLAD2	5.35	1.072			
	RLAD3	5.29	1.178			
Anticipative	EJMT1	5.47	1.129	0.933	0.823	0.893
enjoyment (EJMT)	EJMT2	5.52	1.049			
	EJMT3	5.49	1.084			
Sense of	SOM1	4.61	1.340	0.940	0.796	0.914
Membership	SOM2	4.75	1.319			
(SOM)	SOM3	4.94	1.192			
	SOM4	4.90	1.204			
Information sharing	ISI1	4.99	1.283	0.936	0.785	0.909
Intention (ISI)	ISI2	5.23	1.135			
	ISI3	5.17	1.277			
	ISI4	4.93	1.335			

Tables 2: Psychometric Properties of Measurements

Table 3: 1	Factor Loadin	igs and Cro	oss-loading	gs for All	Constructs.			
	REPT	VTRL	HZRL	RECP	RLAD	EJMT	SOM	ISI
REPT1	0.763							
REPT2	0.822							
REPT3	0.790							
VTRL1		0.720					0.369	
VTRL2		0.762					0.302	
VTRL3		0.774						
HZRL1			0.732					
HZRL2			0.771					
HZRL3			0.728					
RECP1				0.678				
RECP2				0.729				
RECP3		0.300		0.665		0.306		
RECP4				0.690		0.339		
RLAD1					0.629			
RLAD2					0.709			
RLAD3					0.810			
EJMT1						0.787		
EJMT2						0.721		
EJMT3						0.733		
SOM1							0.796	
SOM2							0.794	
SOM3							0.706	
SOM4							0.741	
ISI1							0.355	0.715
ISI2		0.312				0.336		0.680
ISI3			0.308					0.735
ISI4							0.398	0.688

Table 3: Factor Loadings and Cross-loadings for All Constructs

Note: Table shows loadings or cross-loadings > 0.3. The bolded values are loadings.

Table 4: Square Root of AVE and Cross-correlation

	REPT	VTRL	HZRL	RECP	RLAD	EJMT	SOM	ISI
REPT	0.916							
VTRL	0.517	0.904						
HZRL	0.587	0.474	0.907					
RECP	0.598	0.564	0.654	0.853				
RLAD	0.518	0.558	0.581	0.654	0.863			
EJMT	0.535	0.539	0.577	0.670	0.629	0.907		
SOM	0.562	0.662	0.570	0.524	0.545	0.528	0.892	
ISI	0.577	0.605	0.662	0.618	0.555	0.629	0.698	0.886

Note: Diagonal elements are the square root of the AVE values. Off-diagonal elements are the correlations among latent constructs.

Table 5: T	fable 5: The HTMT Results								
	REPT	VTRL	HZRL	RECP	RLAD	EJMT	SOM	ISI	
REPT	-								
VTRL	0.575	-							
HZRL	0.654	0.532	-						
RECP	0.671	0.640	0.739	-					
RLAD	0.588	0.649	0.663	0.761	-				
EJMT	0.595	0.606	0.646	0.758	0.722	-			
SOM	0.618	0.736	0.628	0.584	0.622	0.583	-		
ISI	0.636	0.673	0.734	0.693	0.628	0.696	0.762	-	

5.2. Hypothesis Test

We utilize SPSS to test our hypotheses. To examine moderating effects, we standardize (z-score) the data of all constructs. Following the moderated multiple-regression analysis process (Cohen & Cohen, 1983), we first multiply SOM by each of the six independent variables to generate six product terms. We then enter the independent variables, SOM, and the six product terms into the regression model in sequence. The statistical results are shown in Figure 2 and Table 6.

In step 1, we confirm the significance of the full model, with F = 308.261, adjusted $R^2 = 0.590$, and p < 0.01. Five of the six independent variables (anticipative reputation, vertical relationship, horizontal relationship, reciprocity, and enjoyment) have significant effects on information-sharing intentions (p < 0.01), whereas anticipative relative advantage is insignificant. In step 2, we add SOM into the regression equation. The full model remains significant at p < 0.01, with $\Delta F = 174.681$ and adjusted $R^2 = 0.640$. SOM has a significant effect on information-sharing intentions at p < 0.01 and does not change the significance level of the six independent variables. Therefore, hypotheses H1a, H2a, H3a, H4a, H6a, and H7 are supported, whereas H5a is not supported.

In step 3, we add all six product terms. The results indicate the significance of the full model at p < 0.01, with $\triangle F = 6.721$ and adjusted $R^2 = 0.649$. We find that SOM can significantly moderate five of the six variables' effects on information-sharing intentions. For these four social gratification factors, SOM positively moderates anticipative reputation's effect on information-sharing intentions (p < 0.05) and the effects of anticipative vertical relationships on information-sharing intentions (p < 0.01). H1b and H2b are thus supported. It negatively moderates the anticipative horizontal relationship's effect on the anticipative reciprocity's effect. Therefore, H4b is not supported. In addition, SOM has no moderating effect on the anticipative moderates the relationship between anticipative relative advantage and information-sharing intentions (p < 0.01), which contradicts our hypothesis, so H5b is also not supported. Finally, for hedonic gratification, SOM exhibits a negative moderating effect on the relationship between anticipative enjoyment and information-sharing intention (p < 0.01), thus supporting H6b. We also incorporate four demographic variables, i.e., gender, age, occupation, and net age, into the regression model to test our model. The results indicate that the significances of all the hypotheses remain unchanged. It confirms the veracity of our findings.



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

Figure	2:	Structural	Model	Results
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MODEL	Unstandardiz	zed Coefficients	Standardized Coefficients	т	n volvo
	В	Std. Error	Beta	1	p-value
Step 1					
REPT	0.114	0.024	0.114**	4.673	< 0.01
VTRL	0.248	0.024	0.248**	10.483	< 0.01
HZRL	0.316	0.026	0.316**	12.264	< 0.01
RECP	0.069	0.029	0.069**	2.365	< 0.01
RLAD	-0.002	0.026	-0.002	-0.063	>0.05
EJMT	0.203	0.026	0.203**	7.686	< 0.01
F= 308.261, Adjust R	$^{2} = 0.590$, Depe	endent Variable: Info	ormation sharing inter	tion (ISI)	
Step 2					
REPT	0.057	0.023	0.057**	2.435	< 0.01
VTRL	0.110	0.024	0.110**	4.503	< 0.01

Table 6: Hypothesis Test

HZRL	0.244	0.025	0.244 * *	9.864	< 0.01
RECP	0.090	0.027	0.090**	3.304	< 0.01
RLAD	-0.034	0.025	-0.034	-1.377	>0.05
EJMT	0.181	0.025	0.181**	7.305	< 0.01
SOM	0.330	0.025	0.330**	13.217	< 0.01
\triangle F=174.681, Adjust R ²	= 0.640, Dependent	t Variable: Inform	ation sharing intentio	on (ISI)	
Step 3					
REPT	0.059	0.023	0.059**	2.538	< 0.01
VTRL	0.155	0.026	0.155**	5.927	< 0.01
HZRL	0.209	0.027	0.209**	7.673	< 0.01
RECP	0.079	0.028	0.079**	2.783	< 0.01
RLAD	-0.008	0.026	-0.008	-0.315	>0.05
EJMT	0.154	0.027	0.154**	5.785	< 0.01
SOM	0.319	0.025	0.319**	12.656	< 0.01
REPT*SOM	0.049	0.022	0.063*	2.222	< 0.05
VTRL*SOM	0.067	0.019	0.096**	3.575	< 0.01
HZRL*SOM	-0.062	0.025	-0.081 * *	-2.467	< 0.01
RECP*SOM	-0.028	0.027	-0.037	-1.023	>0.05
RLAD*SOM	0.072	0.025	0.097**	2.842	< 0.01
EJMT*SOM	-0.063	0.024	-0.087**	-2.667	< 0.01

 \triangle F=6.721, Adjust R² = 0.649, Dependent Variable: Information sharing intention (ISI)

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

REPT: Anticipative reputation, VTRL: Anticipative vertical relationship, HZRL: Anticipative horizontal relationship, RLAD: Anticipative relative advantage, RECP: Anticipative reciprocity, EJMT: Anticipative enjoyment, SOM: Sense of Membership

To check the potential existence of common method variance (CMV), we perform a marker-variable test as suggested by Lindell & Whitney (2001). We consider power distance (self-reported subjective data on a seven-point Likert scale) to be theoretically unrelated to other variables, besides, the correlation matrix shows the items of this variable have minimal correlations with other items, and it has no significant effects on all other study variables. Therefore, we believe it is a suitable marker variable in this study. The statistical result demonstrates that the inclusion of marker variable in the research model does not change the significance of the tested hypotheses (Lindell & Whitney, 2001). Consequently, CMV is not a serious problem in this study.

To test unobserved heterogeneity, we use SmartPLS 3 to execute the FIMIX-PLS procedure from one to seven segments (Ringle et al., 2015). Table 7 shows the evaluation criteria and Table 8 shows the relative segment sizes. According to Hair et al. (2016), researchers should consider 1) AIC3 together with CAIC, and 2) AIC4 together with BIC. The number of segments is likely to be appropriate whenever AIC3 and CAIC indicate the same number of segments, and whenever AIC4 and BIC indicate the same number of segments. We find that the lowest value of AIC3 indicates a seven-segment solution whereas the lowest value of CAIC points to a five-segment solution. The lowest values of AIC4 and BIC also indicate different segment numbers (seven and five respectively); furthermore, the highest value of EN points to a two-segment solution. Considering the inconsistency in the number of segments suggested by these different FIMIS-PLS evaluation criteria, we believe those segments are not well separated with

clear and reliable partitions. Therefore, the existence of unobserved heterogeneity is not at a noteworthy level, thus supporting the results of the whole data analysis.

Table 7:	FIMIX-	PLS	Evaluation	Criteria
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	No. of segments								
Criteria	1	2	3	4	5	6	7		
AIC (Akaike's Information Criterion)	2487.083	1546.502	1445.590	1394.359	1326.813	1333.973	1247.062		
AIC3 (Modified AIC with Factor 3)	2494.083	1561.502	1468.590	1425.359	1365.813	1380.973	1302.062		
AIC4 (Modified AIC with Factor 4)	2501.083	1576.502	1491.590	1456.359	1404.813	1427.973	1357.062		
BIC (Bayesian Information Criteria)	2523.166	1623.821	1564.146	1554.152	1527.843	1576.240	1530.566		
CAIC (Consistent AIC)	2530.166	1638.821	1587.146	1585.152	1566.843	1623.240	1585.566		
HQ (Hannan Quinn Criterion) MDI 5 (Minimum	2500.632	1575.535	1490.107	1454.360	1402.298	1424.942	1353.516		
Description Length with Factor 5)	2723.495	2053.098	2222.371	2441.324	2643.963	2921.308	3104.582		
LnL (LogLikelihood)	-1236.542	-758.251	-699.795	-666.180	-624.407	-619.987	-568.531		
EN (Entropy Statistic (Normed))		0.845	0.692	0.617	0.678	0.667	0.668		
NFI (Non-Fuzzy Index)		0.874	0.687	0.580	0.634	0.596	0.572		
NEC (Normalized Entropy Criterion)		198.681	393.820	489.819	412.119	426.646	425.484		

				S	Segment size	S		
No. of Segment		Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6	Segment 7
_	2	0.744	0.256					
	3	0.594	0.246	0.161				
	4	0.536	0.197	0.144	0.123			
	5	0.484	0.249	0.108	0.082	0.077		
	6	0.459	0.238	0.107	0.078	0.064	0.055	
	7	0.465	0.168	0.102	0.089	0.080	0.072	0.023

Table 8: Relative Segment Sizes

6. Discussion and Conclusion

6.1. Discussion of the Results

Based upon U&G theory, this study explores the social, utilitarian, and hedonic gratifications' effects on information contributors' sharing intention. We find that social and hedonic gratification factors serve as crucial antecedents for information-sharing behaviors. Specifically, the statistical results indicate that anticipative reputation, vertical relationship, horizontal relationship, reciprocity, and enjoyment can significantly affect information-sharing intentions. This is consistent with our hypotheses and confirms previous empirical findings (e.g., Gan & Li, 2018; Li et al., 2015; Salehan et al., 2017). However, diverging from prior studies, the direct effect of anticipative relative advantage is insignificant in the research model, which implies that not all types of gratification directly affect information sharing in VCs. Some gratification factors may be ineffective, or only take effect on those with specific personal attributes. Furthermore, after including SOM in the regression equation, the full model explains more

variance in information-sharing intentions, indicating that SOM is a key motivator for information-sharing, thus confirming the findings of a previous study (Sutanto et al., 2011).

The results of the moderation test suggest that SOM moderates the effects of five of the six gratification factors on information-sharing intentions. In particular, our study finds that SOM positively moderates the path of anticipative reputation, which indicates that the potential to gain a good reputation weighs more into the information-sharing decision of high-SOM members. We also confirm our prediction that SOM positively moderates the effect of anticipative vertical relationship on information-sharing intentions, while negatively moderates the effect of anticipative horizontal relationship. It implies that high-SOM members share information to strengthen their ties with closely related acquaintances in the VC, whereas they are not inclined to disclose information to acquire new friends who probably are temporary users or passers-by. Besides, SOM has an insignificant effect on the path of anticipative reciprocity. This finding indicates that high-SOM and low-SOM individuals have an equivalent preference for reciprocal information from others when deciding whether to share information in a VC.

For the utilitarian gratification factor, the positive moderation of SOM on the effect of anticipative relative advantage implies that it exerts a particularly salient effect on the information-sharing intention of high-SOM members. This result is inconsistent with our suggestion that high-SOM members will focus less on utilitarian rewards when making information-sharing decisions than low-SOM users. This unexpected moderation effect could be due to high-SOM members' high level of attachment to VCs, such that they are cognizant of and appreciate the utilitarian rewards from VCs more than low-SOM users do. Finally, we find that hedonic gratification is a stronger factor motivating low-SOM users to share information in VCs than it is for high-SOM members. This finding is consistent with our prediction and suggests that anticipative intrinsic pleasure is a prominent stimulator for encouraging the sharing intentions of low-SOM individuals.

6.2. Theoretical Contributions

Our study represents the initial endeavor to extend U&G theory (Katz, 1959) by incorporating SOM (McMillan & Chavis, 1986), a theoretical concept from community theory, into the context of information sharing in VCs. We explore the direct effects of SOM, as well as its moderating roles between the relationships of various gratification factors and information-sharing intentions. The empirical results validate our research model and support the importance of this research topic. We believe this study provides several theoretical contributions to the literature.

First, we found that SOM could explain more variances beyond the three types of gratification, thus scaffolding SOM as a crucial factor that affects individuals' activities in VCs (McMillan & Chavis, 1986). Second, consistent with the assertions in the previous research that personal attributes adjust the relationships between motivation and user participation (Roberts et al., 2006; Salehan et al., 2017), our study is the first one that investigates and verifies the moderating role of SOM, as one type of personal attribute, in the information-sharing context. The results showed that SOM could moderate most gratification factors' effects on information-sharing intentions. This suggests that the effects of motivational factors derived from U&G theory are contingent on the strength of SOM among VC members. People with different levels of SOM weigh various types of gratification differently when making information-sharing decisions.

Third, the statistical results indicated that, although SOM could moderate the effects of all three types of gratifications, the moderations are not in the same direction. This finding is important and interesting. Specifically, we find that high-SOM and low-SOM users seek different types of social gratifications when considering sharing information (Hsu & Liao, 2014). Besides, high-SOM members are motivated by utilitarian gratification, whereas low-SOM users emphasize hedonic gratification during the information-sharing process (Feng et al., 2016). Overall, our findings suggest that the influencing mechanisms of most forms of gratification depend on the level of SOM of VC users (Li et al., 2015). Examining the effect of gratification without considering the role of SOM is insufficient. A complete understanding of VC users' information-sharing behaviors must include gratification alongside SOM. Therefore, our extended U&G model built by integrating SOM as a moderator serves as a valuable theoretical foundation for future studies to probe the effect of gratification on information sharing in contexts involving communities.

6.3. Practical Implications

The findings of this study also have pragmatic relevance for practitioners of information exchange VCs. First, we suggest that VC practitioners utilize a variety of information technologies and management strategies to improve high-SOM VC members' reputations and help them strengthen connections with their VC friends. For instance, creating a membership ranking system and exhibiting rank in a salient place alongside their postings could be an effective technique. In this way, members who frequently submit information to a VC will be awarded higher ranks and will be valued by other members. Additionally, an information system permitting members to create friend groups in VCs could facilitate communication with existing friends. Furthermore, VC practitioners can focus on strengthening utilitarian rewards for high-SOM members, such as improving their problem-solving capabilities. For example, VC

practitioners may consider analyzing the digital information consumption footprints of VC members and use that information to build a customized information input web page that displays different "information application methods" and "information application scope" for high-SOM VC members. Such a customized web page would be particularly rewarding for them to further consider how to apply such information to solve their problems in daily life.

Second, we suggest VC practitioners pay special attention to encouraging low-SOM users to contribute their knowledge. It is recommended that VC practitioners regularly organize both offline and online activities and invite them to participate. Through these activities, they can make new friends within VCs. Moreover, these activities can also enhance users' SOM (Koh & Kim, 2003-4), thus directly driving their information-sharing intentions. Furthermore, VC practitioners are recommended to create engaging features for these users' information input web pages. It would be possible, for instance, to incorporate cartoon characters expressing gratitude following the completion of information input. We believe through the above means, VC practitioners can successfully motivate low-SOM users to contribute their knowledge. In the long term, the VC will increase the scale of active knowledge contributors, broaden the scope of published knowledge, and finally improve its business performance.

In general, we recommend that VC practitioners design different information technologies and adopt distinct management strategies for low- and high-SOM users to employ in the information-sharing process. 6.4. Limitations and Future Research

Inevitably, this study has several limitations. First, based on a preliminary interview, we incorporate six gratification factors into the research model. Although it is impossible to examine all gratification factors of information-sharing intention, we notice that many empirical U&G studies have identified some other gratification factors (e.g., Gan & Li, 2018; Kaur et al., 2020; Li et al., 2015). Thus, further research is suggested to identify other gratification factors relevant to information sharing in VCs and to explore their joint effects with SOM. Second, the subjects are all located in China. Scholars should be cautious in generalizing the results of this study to other countries or regions that have different cultural orientations, as previous studies (Luo et al., 2014; Sia et al., 2009) have demonstrated that different cultures induce different actions. Thus, similar research can be conducted in other countries or regions with different cultural orientations. Third, with a pre-investigation, we select the six most popular VCs for which to collect data. Nonetheless, we cannot claim that our findings can be applied to all VCs in China. For instance, our survey respondents do not include those from travel information exchange VCs. Thus, future research is expected to explore whether information contributors in different VCs may consider different gratification factors when sharing information. Fourth, we understand that there are two types of anticipative reciprocity, direct reciprocity and generalized reciprocity (Flynn, 2005; Han et al., 2019; Ren et al., 2007). However, in the current study, we only focus on generalized reciprocity in our research model. We acknowledge it as a limitation and strongly suggest further studies explore the effects of both types of reciprocity on information contributors' information-sharing intention. Finally, the independent variables measure the information contributors' anticipative gratifications, instead of their existing statuses. We encourage future research to include both of them in the research model, to check whether they have different effects on information contributors' sharing intentions.

7. Conclusion

Drawing on U&G theory, this study investigates the effects of social, utilitarian, and hedonic gratification on VC members' information-sharing intentions. We further integrate SOM into the theoretical model as both an antecedent and a moderator. The statistical results support the crucial roles of most gratification factors and SOM on information-sharing intentions. Furthermore, the significant moderating effects of SOM on various types of gratifications are also detected. These empirical findings can help IS scholars achieve a nuanced understanding of the influencing mechanisms of different gratification factors for VC users who vary in their SOM. The results also shed light on how VC practitioners implement innovative information technologies and management strategies to promote the prosperity of information exchange VCs.

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Appendix 1. Measurement Items

REPT, adopted from (Wasko and Faraj, 2005).

REPT1 I can earn respect from other members by sharing information in this VC.

REPT2 I feel that sharing information improves my status in this VC.

REPT3 Sharing information can improve my reputation in this VC.

VTRL, adopted from (Salehan et al., 2017).

VTRL1 Sharing information can strengthen the interactions with people that I know personally well in this VC.

VTRL2 Sharing information can maintain a close friendship with people that I know personally well in this VC.

VTRL3 Sharing information can intimate the relationships with my current friends in this VC.

HZRL, adopted from (Salehan et al., 2017).

HZRL1 Sharing information can help me form a new personal online network in this VC.

HZRL2 Sharing information can expand social network in this VC.

HZRL3 Sharing information can form social relationship with general others in this VC.

RLAD, adopted from (Chen and Hung, 2010).

RLAD1 Sharing information in this VC will improve my problem solving skills.

RLAD2 Sharing information in this VC will allow me to rapidly absorb and react to new information regarding the topic at hand.

RLAD3 Sharing information in this VC will assist me in the workplace and improve my job performance.

RECP, adopted from (Kankanhalli et al., 2005).

RECP1 When I share information in this VC, I believe that I will get an answer for giving an answer.

RECP2 When I share information in this VC, I expect other members to respond when I am in need.

RECP3 When I share information in this VC, I expect to get information when I need it.

RECP4 When I share information in this VC, I believe that my queries will be answered in the future.

EJMT, adopted from (Gan and Li, 2018).

EJMT1 I find sharing information in this VC to be enjoyable.

EJMT2 The process of sharing information in this VC is pleasant.

EJMT3 I have fun during information sharing process in this VC.

SOM, adopted from (Koh and Kim, 2003-4; Luo et al., 2015).

SOM1 I feel that I belong to this VC.

SOM2 I feel membership in this VC.

SOM3 I feel that the members of this VC are my close friends.

SOM4 I like the members of this VC.

ISI, adopted from (Bock et al., 2005; Lai and Chen, 2014).

ISI1 I intend to frequently share information with other members in this VC.

ISI2 If I have some information about a topic, I would like to post it on this VC.

ISI3 I will always provide my information to other VC members.

ISI4 I often actively share my information with other members in this VC.