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Understanding the Health Information Sharing Behavior of Social Media Users: An Empirical Study on WeChat

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ABSTRACT

Studies have focused on elucidating the sharing behavior of media users. However, few studies have specifically investigated users' health information sharing behavior in the social media context, especially WeChat. This study proposes a theoretical research model that integrates social capital and user gratification with the theory of planned behavior to explore health information sharing behavior of WeChat users. Based on online survey data collected from 616 WeChat users, correlation analysis and structural equation modeling were sequentially performed. It was found that both social capital and gratification factors play important roles in influencing WeChat users' health information sharing. Social interaction, acting both as social capital and gratification factor directly and indirectly generated positive effects on health information sharing intention. In conclusion, this study revealed the key determinants of health information sharing intention among WeChat users and examined the mediation effects to effectively understand users' health information sharing behavior.

KEYWORDS

Health Information, Information Sharing, Social Capital, TPB, Uses Gratification, WeChat

1. INTRODUCTION

Social media, which provides online tools or platforms that allow people to freely and easily share their thoughts, experiences, perspectives, and knowledge (Kwahk & Park, 2016), has revolutionized the way people communicate (Zou et al., 2015; Zhang et al., 2017). The rapid development of telecommunication technology (e.g. 5G) and enhanced accessibility to social networks have prompted an increasing number of individuals to turn to social media application in order to obtain various types of information. A typical example of such information is medical and health information (Deng et al., 2015). Health information mainly consists of personal health awareness, treatment options, and personal success experiences (Johnston et al., 2013). To cope with illness and make well-informed decisions, people require information regarding the illness, associated therapeutic options, and other health matters (Varshney, 2014; Bolle et al., 2015). Previous studies focused on health information acquisition through the Internet and new media, as well as the related improvement of healthy living

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habits (Verhoef et al., 2014; Grajales et al., 2014; Deng & Liu, 2017). In the era of mobile Internet, social media has become one of the most important health information exchange channels and platforms. With the help of social media, users can share health information or their own health-related experiences (Li et al., 2018). Social media platforms highlight a more customer-oriented experience and enables the sharing of health information (Kamel Boulos & Wheeler, 2007). Social media use positively impacts on health behaviors (Laranjo et al., 2014)

As to China, Webchat is one of the most popular social media, which provides innovative tools of communicating as text messaging, one-to-many messaging, photo/video sharing, and so on. WeChat has continually enriched and optimized its applications (Gan, 2017). For instance, WeChat Moments provide a platform for sharing information and pictures with captions (Zhang et al., 2017; Shao & Pan, 2019). WeChat Group service provides a virtual interactive community in which users can share different information in different groups based on the intimacy of the relationships and relevance of the topic (Pi et al.,2013). Official Public Account is a service WeChat provides for certified commercial/official/social entities or certified persons to help them offer one-to-many messaging or information (Ma et al., 2018). WeChat users are familiar with searching for useful information in Official Public Account and share the ones they find useful in their WeChat Moments. In conclusion, the growing popularity of interactive social platforms (e.g. WeChat) presents a variety of challenges concerning public health information acquisition and sharing. Based on its features, a variety of health-related information may be found on WeChat. In the meantime, WeChat plays an important role in health information expression among Chinese people.

Previous studies have established that people are inclined to turn to friends and family for information and advice on how to cope with illness (Johnston et al., 2013). As a social media platform focused on real interactions and familiarity, WeChat is a superior platform for health information sharing. Due to closeness and trust, WeChat users often share useful health information or knowledge with their family or friends through WeChat functions, such as WeChat Official Public Account, WeChat Moments, and WeChat Group. This is especially apparent during critical incidents. Take 2019-nCoV in China between 2019 to 2020 for example. For example, in the context of dealing with the, WeChat has become an important tool for tracking pandemic-related information for the Chinese. Through the Official Public Account, the Chinese government publishes real-time reports on the pandemic. In cooperation with companies, it develops useful tools for tracking people and whether they have been in contact with virus carriers, so as to help citizens accurately assess their health conditions. Additionally, many people study related pandemic prevention information and obtain scientific prevention advice through WeChat Groups.

Given the strong relationship between WeChat and health information, it is worth investigating users' health information sharing behavior on WeChat. There are three main theories that are relevant to such research. The theory of planned behavior (TPB) is a fundamental model that has been used to analyze individual intentions and behavior (Al-Debei et al., 2013). The uses and gratifications (U&G) theory is an important social media theory that provides a user-centered view to reveal the social and psychological motives that affect individuals' use of a particular social media platform (Leung & Wei, 2000). Social capital theory has also been found to be a significant facilitator of knowledge sharing behavior (Lee et al., 2014; Chung et al., 2016). Therefore, this study intends to integrate the above three theories to explore the factors affecting health information sharing behavior of WeChat users.

This paper is organized as follows: Section 2 provides the theoretical background and hypotheses; Section 3 presents the research methods; The data analysis and results are reported in section 4; Section 5 discusses the research findings, while Section 6 presents the conclusion, which includes implications, limitations, and future research suggestions.

2. THEORETICAL FRAMEWORK AND RESEARCH MODEL

2.1 Theory of Planned Behavior and Health Information

2.1.1. TPB and Health Information Sharing in the Social Media Context

The theory of planned behavior (TPB), which includes the theory of reasoned action (TRA), is an influential socio-psychological theory that explains how certain factors affect a particular behavior (Ajzen, 1991). According to TPB, behavioral intention can be predicated by three main factors; attitude, subjective norms, and perceived behavioral control (Huang & Hsu, 2009). TPB is a well-established and influential theory for behavioral prediction and for explaining the determinants of people's decision-making processes (Armitage & Conner, 2001). TPB has been extensively applied in a variety of contexts, such as knowledge sharing (Hsu et al. 2007), web/mobile application usage (Al-Debei et al., 2013), social network use (Hosein et al., 2016), purchasing (Xu et al., 2020), customer satisfaction (Liao et al., 2007). TPB and its elements are useful for investigating factors influencing or predicting information sharing intentions (Pi et al., 2013). For instance, taking knowledge sharing as a study objective, Lin (2011) found a positive relationship between attitude and knowledge sharing intention. With regard to brand sharing behavior, Gvili and Levy (2019) established that online shoppers' subjective norms, attitude, and perceived behavioral control positively influenced brand information sharing intention. TPB has been used to study health information intention and behavior, especially in the context of internet / mobile internet. Based on a survey of Taiwan Facebook users, Lin et al. (2018) identified factors (e.g., opportunities for socializing and self-improvement of health) that affect the performance expectations of people who use social networking sites for health purposes.

2.1.2. Hypotheses H1, H2 and H3

Behavioral intention refers to the self-perceived likelihood of being able to perform a given behavior (Jafarkarimi et al., 2016). According to TPB, subjective norm is the predicate factor of behavioral intention (Johnston & Warkentin, 2010). Prior studies have shown that subjective norms have significant positive impacts on e-commerce purchase intentions (George, 2004), intentions to continue using Facebook (Al-Debei et al., 2013), behavioral intentions toward technology (Lee, 2010) and social network tools (Hosein et al., 2016). The positive relationship between subjective norms and intention has also been found in health-related scenarios, such as organic food consumption (Chen & Tung, 2014) and purchase (Yadav & Pathak, 2016). Regarding health information and sharing, many studies found subjective norm to be an important factor associated with knowledge sharing intention (Luo, 2009). Lin et al. (2018) shown that subjective norms significantly affect behavioral intention in health-related information sharing and acquiring in a social website.

H1: Subjective norms will positively influence user's health information sharing intentions.

With regards to TPB, attitude is reliable for predicting individual's intentions and behaviors. Prior studies have established that attitude positively affects behavioral intention (Lin, 2007; Han et al., 2017). As for health information and sharing, Pi et al. (2013) reported that subjective norms and attitude are closely associated with an individuals' intention to share knowledge on Facebook. Prior studies have shown the significantly positive effect of attitude on health-related information sharing intention in the SNS context (Lin et al., 2018). Bao et al. (2017) established attitude as one of the predictors of intention to use online health information for adults when searching for useful information for their parents.

H2: Attitude will positively influence the user's health information sharing intentions.

Perceived behavioral control reflects previous experience, confidence, and self-perceived ability to perform a certain behavior, and it is a good predictor of intention and, consequently, of behavior in various contexts or research domains (Hsu et al., 2017; Xu et al., 2020). Perceived behavioral control is the most important predictor of pro-environmental behavioral intention (Patel et al., 2020), both in collective or individualistic cultures (Kai & Haokai, 2016). Regarding general health, Girelli et al. (2016) established that perceived behavioral control positively affects the food consumption intention. Similar findings have also been documented in functional foods (Nystrand & Olsen, 2020). Bao et al. (2017) revealed that perceived behavioral control is a predictor of intention to use online health information. We proposed the following hypothesis:

H3: Perceived behavioral control will positively influence user's health information sharing intentions.

2.2. Social Capital

Social capital refers to the resources accumulated through relationships among people which may enhance the ability to advance personal interests (Coleman, 1988). Nahapiet and Ghoshal (1998) described social capital as a valuable asset that stems from access to resources made available through social relationships. They defined it as: the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998, p. 242).

Previous studies have used social capital to explain the diversity of pro-social behaviors, such as group actions taken for other people or community involvement. Okoli and Oh (2007) described social capital as the resources accumulated through relationships among people. Chow and Chan (2008) examined the impacts of social capital factors on employees' knowledge sharing intentions. Cao et al. (2016) documented that social capital refers to the resources embedded within an individual's or an organization's network of relationships, including both interpersonal relationships and the resources rooted in the relationships.

The social capital concept is also used in online or virtual communal research to explain the role of relational resources embedded in virtual network relationships involving resource and information exchange (Ridings et al., 2002). Chiu et al. (2006) investigated the motivations behind people's knowledge sharing in virtual communities by integrating the social cognitive theory and the social capital theory. Chen et al. (2020) documented that social capital is an important motivation for an individual's knowledge seeking and sharing behavior in the virtual community. Due to the increasing use of SNSs, studies on the relationships between social capital and SNS are underway. Zhang et al. (2017) investigated the general publics' perception of the impact of the rapidly emerging social media on health information acquisition. Fu et al. (2017) examined how users' social capital focus influenced Facebook users' psychological incentives for content sharing. The above-mentioned studies are beneficial for understanding the role of social capital on the behavioral patterns of social media users when it comes to information exchange.

Compared to studies on health information-seeking behavior, studies on health information sharing behavior are relatively few. This is attributed to the fact that before Web 2.0 and social media, there was hardly an option for non–healthcare professionals to share health information (Yan et al., 2016). Li et al. (2018) focused on the factors that affect users' intentions to seek and share health information on social media based on social support theory. However, a limited number of studies have established the correlations between social capital and health information sharing intention. Laying emphasis on social capital theory, Chen et al. (2020) proposed a research model for college students who use WeChat when seeking information and sharing comments in youth league campus activities. Based on previous studies, we can conclude that the social capital theory offers a theoretical framework within which to study the relationship between network-based social exchange and information sharing. From

Chen's research, we postulate that social capital theory provides a useful base for understanding the behavior of health information sharing intention on social media (e.g. WeChat).

2.2.1. Hypotheses H4, H5 and H6

Social capital encompasses a wide range of topics. However, many studies have adopted the definition proposed by Nahapiet and Ghoshal (1998), while proposed that social capital can be examined based on relational, cognitive and structural dimensions. This study adopts the same definition and focus on factors derived from the three dimensions of it. Previous studies (Chow & Chan, 2008; He et al., 2009) have posited social trust, shared visions, and social interaction as the major constructs representing the relational, cognitive, and structural dimensions of social capital, respectively. The relational dimension of social capital refers to the personal relationships that develop through a history of interactions with each other (Yim & Leem, 2013). Relationships built on respect and friendship influence network members' behavior, and helps them obtain valuable assets from each other (Li & Ye, 2014). Trust is a key facet of relational capital and is frequently used to measure the relational dimension of social capital. It was found to exert a significant positive effect on SNS users' willingness to engage in communications (Chu & Kim, 2011).

Previous studies have shown that trust is an important factor in communal knowledge and information sharing (Zhang & Liu, 2018; Jin et al., 2019). When people trust each other, they believe that others are willing and are able to share their information or knowledge. Lin et al. (2009) found that social trust is one of the significant determinants of knowledge sharing in online communities. Furthermore, Hau et al. (2013) confirmed that a higher level of social trust facilitates a higher behavioral intention to share innovation-conducive knowledge. Prior studies have recognized trust as a determinant of consumer attitudes and subjective norms (Al-Debei et al. 2015). In our context, subjective norms reflect WeChat users' perceptions of whether performing health information sharing is accepted and encouraged by their platform friends in WeChat Moments of various chatting groups. In terms of relational capital (Wasko & Faraj, 2005), the users who are committed to the platform indicate that they tend to recognize and abide by the platform's norms regarding achieving health information sharing. Regarding the relationship between social trust and attitude, Lien and Cao (2014) reported that trust positively influences WeChat users' attitudes. Yeon et al. (2019) found that trust toward the platform exerted a positive effect on attitude, and thus accumulates customer loyalty. Thus, we developed the following hypothesis:

H4: Social trust will positively influence health information sharing intentions (H4a), subjective norms (H4b), and attitude (H4c).

The cognitive dimension of social capital refers to "those resources providing shared representations, interpretations, and systems of meaning among parties" (Nahapiet & Ghoshal, 1998). The increasing social capital related studies have addressed shared vision as the key construct for measuring cognitive capital (Whipple et al., 2010). Inkpen and Tsang (2005) regarded shared visions as the "collective goals and aspirations" that promote similar perceptions and mutual understanding. Moreover, Chiu et al. (2006) observed that shared visions help network members understand knowledge sharing benefits, thus strength sharing actions.

In this study, WeChat users who share a vision are more likely to become "WeChat friends", and the presence of shared visions promotes mutual understanding and exchange of ideas. Shared visions can, therefore, be considered as the force that holds people together and lets them share what they know. With collective visions, platform users tend to believe that other user's self-interests will not adversely affect them and they will all contribute their information or resources to help achieve their mutual values. Shared visions, acting as the cognitive dimension of social capital, facilitate users' attitudes, subjective norms and their health information sharing intention through the WeChat platform. Thus, we proposed the following hypotheses:

H5: Shared visions will positively influence health information sharing intention (H5a), subjective norms (H5b), and attitude (H5c).

Structural dimension of social capital refers to the network of interpersonal relationships formed by the interactions of the members within a network (Wasko & Faraj, 2005; Chiu et al., 2006;). It is usually expressed by network connections among network members, and it rests on the existence of connections and their configurations within a social structure (Yim & Leem, 2013). In the social media context, social interactions are considered to be significant attributes that affect individuals' psychological mechanisms and subsequent behavioral intentions (Shao & Pan, 2019). Several studies have addressed social interaction as the key facilitator of information sharing (Okazaki et al. 2017; Villena et al., 2011). Thus, frequent social interactions permit social media members (e.g. WeChat users) to learn more about each other and to exchange more important and valuable information.

In the social media context, studies have examined users' motivations and attitudes towards adopting Facebook and WeChat (Chang & Zhu, 2011; Kim et al., 2011).Subjective norms reflect individual perceptions of social pressure to perform a behavior which significantly contributes to the prediction of intention to engage in health-related behaviors (Cheng et al.,2018). SNSs members with extensive social interactions, perceive greater social pressure for sharing their knowledge, because a good relationship results in high expectations of colleagues, including favorable actions. When users communicate and interact on WeChat, they also need to abide by the corresponding subjective norms in order to maintain good social interaction and interpersonal relationships. We proposed the following hypothesis:

H6: Social interaction will positively influence health information sharing intentions (H6a), attitude (H6b), and subjective norms (H6c).

2.3 Uses and Gratifications

Uses and gratifications theory(U&G) was developed based on the social and psychological origins of needs (Lien & Cao, 2014), which attempts to explain what social and psychological needs motivate users to select particular media channels and content choices, then the subsequent attitudinal and behavioral effects (Lee & Ma, 2012). Prior studies have expanded U&G theory to social media contexts, especially attempting to explain usage motivations of various popular social media apps, such as Twitter (Han et al., 2015), Weibo (Gan & Wang, 2015) and WeChat (Gan, 2017; Gan & Li, 2018). Based on the theoretical foundation of UGT, we assumed that health-related information sharing behavior in the WeChat context is stimulated by particular gratifications.

On the account of UGT and previous studies (Lee & Ma, 2012; Aharony, 2015), we selected three generally used motivations (social interaction, entertainment, and information seeking) to explore the health information sharing behavior of WeChat users. According to U&G theory, users choose certain social media platforms or perform certain social media behaviors in order to meet their social and psychological needs (de Oliveira et al., 2016). Taken as the structural dimension of social capital discussed above in our study, social interaction can also be used as social gratifiers in U&G studies (Al-Jabri et al., 2015). Since we have discussed the social interaction construct and proposed hypotheses, the relevant content will not be repeated here.

2.3.1. Hypotheses H7 and H8

Concerned with the fulfillment of hedonic expectation, entertainment has been identified as a prominent predictor of many types of social media use (Lee & Ma, 2012; Gan & Wang, 2015). For instance, McQuail (2005) found that the value of media entertainment is attributed to the ability to

satisfy users' needs for escapism, enjoyment, emotional release, and anxiety relief. De Oliveira and Huertas (2015) stated that the entertainment value positively affects satisfaction on Facebook, further impacting the use of particular functions. In our study, entertainment is defined as the degree or way by which shared health information helps users acquire entertainment and escape pressure (Zhang et al., 2016). During health information sharing, users can participate in topics, discussions, and other interactions to feel happy and release stress. We state that:

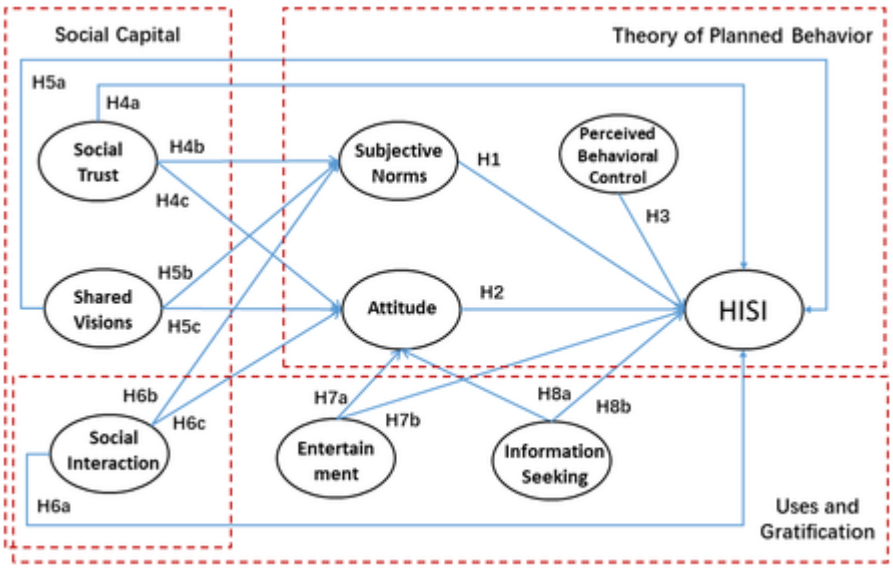
H7: Entertainment will positively influence attitude (H7a) and users' intention to share health information (H7b).

Information seeking refers to the extent by which the shared health information provides users with relevant, timely, and useful information (Lien & Cao, 2014). As an increasingly popular source, social media provides a convenient way for users to obtain information and plays a vital role in information exchange (Kim et al., 2014). Previous studies argued that social media users can satisfy their information need through information seeking, further affecting their behavior. In a study exploring Chinese users' continuance intention in online social networks, Sun et al. (2014) discussed users seeking useful information as one psychological motive of Chinese SNS users. Meanwhile, Hur et al. (2017) confirmed that the information seeking motive, entertainment motive, and relationship maintenance motive positively influence continuing social media usage and information sharing intentions among TSM users. The following hypotheses were proposed:

H8: Information seeking will positively influence attitude (H8a) and users' health information sharing intention (H8b)

Figure 1 presents the research framework of this study. A summary of operational definitions is provided in Appendix A.

Figure 1. Research framework



Note: HISI = Health information sharing intention.

3. RESEARCH METHOD

3.1. Research Sample

Only those WeChat users who had sent out at least one message during the past month (monthly active users) were qualified to participate in the survey. This requirement fits the assumption of U&G theory for active media users (Lien & Cao, 2014). Additionally, we only surveyed WeChat users who live within the Chinese mainland.

Given that web-based surveys have emerged as effective means for collecting academic research data (Hsu & Lin, 2015), the empirical data for this study were partly collected through professional online survey organization (Sojump) (www.wjx.cn). Sojump is one of the most popular online survey companies in China and can reach the qualified respondents from its large consumer database (Lien et al., 2017). Participants who submit valid questionnaires receive material rewards. Of the 550 questionnaires distributed, 498 usable questionnaires (90.5%) were collected and used for subsequent analysis. The other part of the empirical data was collected through a paper-based survey of college students from Beijing. As university students constitute the largest portion of social media users (Kantar, 2015), a large proportion of college students in the sample is considered appropriate. Of the 125 questionnaires distributed in this part, 118 usable questionnaires (94.4%) were collected and used for subsequent analysis.

Finally, a total of 616 valid responses were used in further analyses. Among these responses, 44.5% were male respondents while 55.5% were female respondents. Most of them were aged between 18 and 25 (65.6%) or 26 and 33 (24.8%), with the rest aged between 34 and 41 (6%), over 41 (2.8%), or below 18 (0.8%). The educational achievements of the respondents were bachelor's degree (66.7%), master's degree or above (25.2%), high school (6.8%), doctorate degree (0.6%), and junior college (0.6%). Respondents who had been using WeChat for more than 3 years constituted the largest portion of the sample (476, 77.2%), 3 to 4 years (158, 25.6%), 4 to 5 years (138, 22.4%), over 5 years (180, 29.2%). Most of the respondents used WeChat more than five times a day (71.4%), followed by 3 to 5 times (18%). Many respondents spent 1 to 3 hours on WeChat per day (53.9%), and some often spent more than 3 hours per day (24.5%).

3.2. Survey Instrument and Measures

A questionnaire with two parts was used in this study to test the hypotheses above. The first part used nominal scales to collect demographic information, including gender, age, education level, daily time spent on WeChat, WeChat use frequency, and WeChat experience. The second part consisted of 9 constructs, i.e., social trust, shared visions, social interaction, entertainment, information seeking, subjective norms, attitude, perceived control behavior, health information sharing intention. All of the measurement items were adapted from prior research to ensure the validity of these constructs and to fit the context of "health information sharing" in WeChat (see Appendix B). Each item was measured on a seven-point Likert scale from strongly disagree (1) to neutral (4) to strongly agree (7). A total of 34 items were used. The original questionnaire was constructed in English. The back-translation approach was then used to compare the English version of the questionnaire to the Chinese one. After completing the questionnaire, 20 participants with WeChat use experience were invited to complete a pretest. According to their comments, some items were revised to improve the questionnaire's clarity and understandability.

4. DATA ANALYSIS AND RESULTS

This study adopted the partial least square (PLS) approach to test the research model. As a structural equation modeling (SEM) technique, PLS is suitable for identifying the causal relationships between construct variables and enables the simultaneous examination of measurement items and structural models (Petter et al., 2007). Besides, as PLS has relaxed requirements for the variable normality

and randomness, it is suitable for handling the relationships between variables in an abnormal data distribution. Moreover, it has the advantage of analyzing complex prediction models (Chin & Newsted, 1999). Integrating social capital theory, U&G theory, and TPB model, our study explored the causal relationships among nine latent variables. To inquire into the causal relationships between variables, reduce measurement errors, and avoid collinearity, PLS was suitable for the current study. SmartPLS 3.0, a professional PLS analysis software developed by Ringle et al. (2015), was used to analyze the data.

4.1. Outer Model and Scale Validation

In the outer model test, indicator reliability, consistency reliability, and construct validity were measured. Indicator reliability indicates the extent by which a variable or set of variables is/are consistent with what it/they intend to measure (Chin, 1998a). Factor loading indicates the extent by which the construct can be measured by a specific question, and the threshold value is 0.6; this is used to represent individual items' reliability (Hair et al., 2013). Based on the recommendation of Vinzi (2003), we eliminated reflective indicators with small outer standardized loadings from measurement models. Indicator loadings are presented in Table 1.

Consistency reliability was evaluated by internal consistency and composite reliability. Both Cronbach's alpha values and composite reliability values are presented in Table 1. The traditional criterion for internal consistency is Cronbach's alpha (Barclay et al. 1995; Chin 1998b), which provides an estimate of the reliability based on the indicator intercorrelations. As shown in Table 1, the Cronbach's alpha values were between 0.715 and 0.776, indicating an acceptable level of reliability. All composite reliability (CR) values for each construct were higher than the threshold value of 0.7 (Chin, 1998b), indicating that the constructs were internally consistent. Convergent validity can be evaluated by checking the average variance extracted (AVE). The AVE values for all of the constructs were above 0.572, which was higher than the suggested threshold value of 0.5 (Fornell & Larcker, 1981), indicating good convergent validity.

Discriminant validity detects the degree of discrimination between tested variables and different construct criteria. As shown in Table 2, the Fornell-Lacker analysis indicated that the square root of the AVEs for each construct was greater than the correlations with other constructs, which indicated that all of the constructs had good discriminant validity. Additionally, all of the heterotrait-monotrait

Table 1. Consistency and Reliability Test

Constructs	Indicator Reliability	Consistency Reliability		Convergent Validity
	Outer Factor Loading	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
ST	0.789~0.863	0.757	0.860	0.673
SV	0.793~0.811	0.724	0.845	0.644
SI	0.771~0.847	0.737	0.851	0.656
ENT	0.781~0.855	0.746	0.855	0.664
IS	0.744~0.835	0.715	0.841	0.638
SN	0.772~0.851	0.735	0.850	0.654
ATT	0.798~0.840	0.755	0.860	0.672
PBC	0.730~0.782	0.738	0.836	0.560
HISI	0.746~0.786	0.774	0.855	0.595

Note: ST = social trust; SV = shared visions; SI = social interaction; ENT = entertainment; IS = information seeking; SN = subjective norms; ATT = attitude; PBC = perceived behavior control; HISI = health information sharing intention.

Table 2. Discriminant Validity of Constructs: Fornell-Larcker

Items	Inter-Construct Correlations								
	ST	**SV**	**SI**	**ENT**	**IS**	**SN**	**ATT**	**PBC**	**HISI**
ST	**0.820**								
SV	0.347	**0.803**							
SI	0.290	0.440	**0.810**						
ENT	0.404	0.540	0.449	**0.815**					
IS	0.424	0.472	0.446	0.547	**0.799**				
SN	0.301	0.534	0.530	0.449	0.446	**0.809**			
ATT	0.486	0.431	0.408	0.581	0.544	0.399	**0.820**		
PBC	0.432	0.447	0.347	0.495	0.463	0.439	0.521	**0.749**	
HISI	0.469	0.524	0.485	0.559	0.533	0.545	0.535	0.498	**0.771**

Notes: Diagonal and bold elements are the square root of AVE between the constructs and their indicators. Non-diagonal elements are correlations between constructs.

(HTMT) values were lower than the 0.90 threshold (Gold et al., 2001), confirming discriminant validity (Henseler et al., 2015) (Table 3).

We computed the goodness of fit (GOF) following Tenenhaus et al. (2005) procedures to understand the overall quality of the proposed model. The GOF is calculated as follows:

$$GOF = \sqrt{\overline{AVE} \times \overline{R^2}} = \sqrt{0.6396 \times 0.4607} = 0.5428$$

The GOF was 0.5428, which exceeds the cut-off criterion of 0.36 for a large effect size.

This study collected data using self-reported surveys in a single method, which may suffer from a potential CMB threat (Podsakoff et al., 2003). We used Harman's single-factor test to assess CMB. The results showed that no single factor could account for the majority of variable covariance. The most covariance explained by one factor was 33.6 percent (less than 50%), indicating that the results may not be contaminated by CMB.

Table 3. Discriminant Validity of Constructs: HTMT

Items	ST	SV	SI	ENT	IS	SN	ATT	PBC	HISI
ST									
SV	0.467								
SI	0.387	0.600							
ENT	0.537	0.737	0.605						
IS	0.581	0.655	0.616	0.748					
SN	0.401	0.732	0.717	0.607	0.613				
ATT	0.642	0.582	0.546	0.772	0.740	0.536			
PBC	0.579	0.610	0.470	0.669	0.636	0.595	0.698		
HISI	0.608	0.695	0.641	0.729	0.713	0.718	0.697	0.656	

4.2. Inner Model and Hypotheses Testing

Having confirmed the good psychometric properties of the outer model, the inner model was analyzed to assess its explanatory power, significance of the paths with PLS test, and implementation of structural equation modeling. The path coefficient, *t*-values, significance, and hypothesis testing results for the inner model are tabulated in Table 4 and illustrated in Figure 2.

Bootstrapping with 5,000 resamples was performed for the structural model of PLS-SEM estimation. Both R^2 and Q^2 values are presented in Figure 2. The overall explanatory power of our research model had an R-square of 52.1% for health information sharing intention and an R-square of 39.8% for subjective norm, and 46.3% for attitude toward health information sharing intention, suggesting that the extended TPB model was capable of explaining intention to share health related information through WeChat. The Q^2 value for each endogenous construct was greater than 0, which verified the predictive relevance in the structural model. Such explanatory power and predictive relevance substantiate the model's predictive validity (Hair et al., 2013).

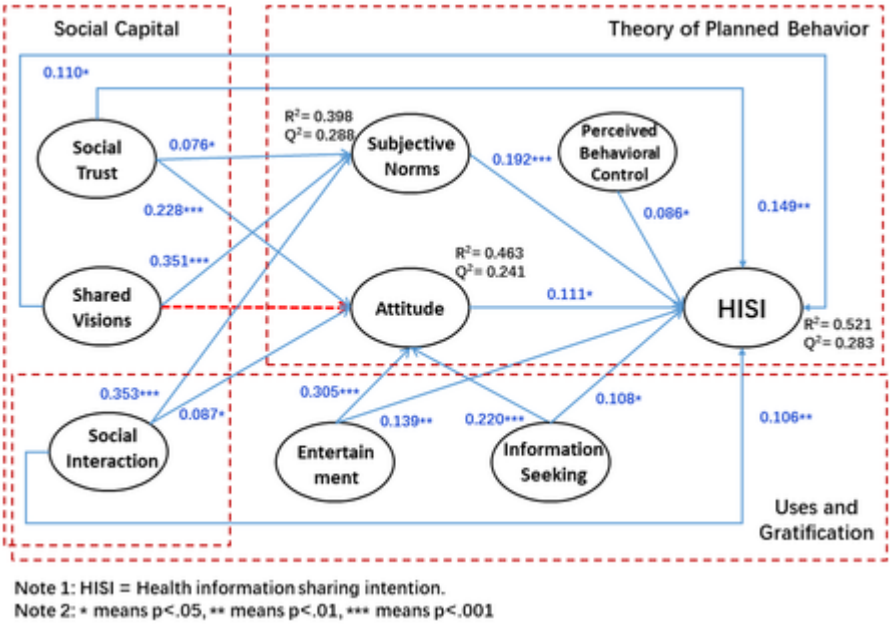
4.3. Testing of Mediation Effects

A traditional method for testing the significance of mediation effects is the Sobel test, which has been adopted by prior related researchers (Helm et al., 2010; Chen et al., 2017). The mediator provides significant mediation between the independent variable and the dependent variable if the absolute *z*-value of a mediator is higher than 1.96. However, Preacher and Hayes (2004, 2008) showed that the Sobel test is not appropriate for analyzing indirect effects because the parametric assumptions of paths a and b do not hold for the product term of the two paths if one assumes that a and b are normally distributed. Therefore, we applied bootstrap routines to test the significance of the indirect effect following Nitzl's (2016) suggestion. We adopted the 95% confidence interval of the specific

Table 4. Summary of inner model results

Hypothesis		Path	Path Coefficient	Sample Mean	Standard Deviation	*t*-Value	Result
H1		SN→HISI	0.192***	0.193	0.048	4.014	Supported
H2		ATT→HISI	0.111*	0.111	0.045	2.435	Supported
H3		PBC→HISI	0.086*	0.089	0.042	2.048	Supported
H4	**H4a**	ST→HISI	0.149**	0.147	0.043	3.446	Supported
	H4b	ST→SN	0.076*	0.076	0.035	2.155	Supported
	H4c	ST→ATT	0.228***	0.228	0.042	5.432	Supported
H5	**H5a**	SV→HISI	0.110*	0.109	0.051	2.162	Supported
	H5b	SV→SN	0.351***	0.352	0.038	9.193	Supported
	H5c	SV→ATT	0.045	0.048	0.038	1.199	Not Supported
H6	**H6a**	SI→HISI	0.106**	0.106	0.041	2.607	Supported
	H6b	SI→SN	0.353***	0.353	0.040	8.845	Supported
	H6c	SI→ATT	0.087*	0.086	0.038	2.291	Supported
H7	**H7a**	ENT→ATT	0.305***	0.305	0.046	6.703	Supported
	H7b	ENT→HISI	0.139**	0.138	0.045	3.075	Supported
H8	**H8a**	IS→ATT	0.220***	0.218	0.052	4.238	Supported
	H8b	IS→HISI	0.108*	0.108	0.048	2.246	Supported

Figure 2. Research results



Note 1: HISI = Health information sharing intention.
Note 2: * means p<.05, ** means p<.01, *** means p<.001

mediating effects, obtained with 5,000 bootstrap resamples. The mediation effects tested by the two methods are shown in Table 5.

As shown in Table 5, the z-values of ST → SN → HISI and SI→ATT→HISI were below 1.96, which meant that the mediators of SN between ST and HISI as well as ATT between SI and HISI were not significant. Meanwhile, the *p*-value of ST→SN→HISI path and SI→ATT→HISI path produced by the bootstrapping method were greater than 0.05. It also indicated that the SN mediation effect between ST and HISI was not significant and that the ATT mediation effect between SI and HISI was not significant. In addition, the z-values of ENT→ATT→HISI and IS→ATT→HISI were both above 1.96, while the corresponding p values were less than 0.05. The results implied that the ATT mediation effect between ENT and HISI as well as the ATT mediation effect between IS and HISI were all significant.

5. DISCUSSION

Referring to social capital theory and U&G theory, this study examined health information sharing through social media by extending the TPB model. Specifically, we investigated a proposed research model that assesses the underlying mechanism of the associations among social motivations, user gratification, and health information sharing behavior in the context of WeChat. While few studies have specifically explored health information and WeChat simultaneously, this study highlighted their characteristics in the model construction.

Drawing on social capital theory and the TPB model, our study explored the relationships of three different dimensions of social capital (social trust, shared vision, and social interaction) with attitude, subjective norms, and health information sharing intention. Based on the results of H4, H5, and H6, it was established that social capital factors positively and significantly influence health information sharing in WeChat. Results of H4 revealed that social trust influences subjective norm, attitude and health information sharing intention. Furthermore, the results indicated that the mediated effect of

Table 5. Mediation effects testing

Path	Original Sample	Sample Mean	Standard Deviation	*t* Statistic	Code
ST → SN	0.076	0.076	0.035	2.155	a
ST → ATT	0.228	0.228	0.042	5.432	b
SV → SN	0.351	0.352	0.038	9.193	c
SI → SN	0.353	0.353	0.040	8.845	d
SI → ATT	0.087	0.086	0.038	2.291	e
ENT→ATT	0.305	0.305	0.046	6.703	f
IS→ATT	0.220	0.218	0.052	4.238	g
SN→HISI	0.192	0.193	0.048	4.014	h
ATT→HISI	0.111	0.111	0.045	2.435	i

IE Path	IE Estimate	Sobel Z Test	Bootstrap 5,000 times			Percentile 95%	
			SE	*t*	*p*	Lower	Upper
ST → SN → HISI	0.015	1.575	0.0081	1.8003	0.0723	0.0016	0.0328
ST → ATT→ HISI	0.025	2.041	0.0122	2.0707	0.0388	0.0048	0.0518
SV → SN → HISI	0.067	3.460	0.0186	3.6202	0.0003	0.0332	0.1058
SI→SN→HISI	0.068	3.464	0.0185	3.6672	0.0003	0.0336	0.1064
SI→ATT→HISI	0.010	1.477	0.0060	1.6087	0.1082	0.0004	0.0237
ENT→ATT→HISI	0.034	2.114	0.0147	2.2957	0.0220	0.0067	0.0651
IS→ATT→HISI	0.024	2.029	0.0112	2.1829	0.0294	0.0044	0.0482

Note: IE = indirect effect.

social trust on information sharing intention through attitude does exist, however, this mediation effect was not found among social trust, subjective norm, and health sharing intention.

The results for H5b and H5c suggested that shared visions exert a positive impact on subjective norms, while they not exert an impact on attitude. These findings are not consistent with the results of the study performed by Chow and Chan (2008). Moreover, this mediation effect was found among shared visions, subjective norm and health information sharing intention. Results for H6a, and H6b indicated that social interaction produces a direct effect, which is in accordance with the findings of Hau et al. (2013) and Okazaki et al. (2017), and, generates an indirect effect on sharing intention through subjective norm. The H6a, and H6c results also indicated that the mediated effect of social interaction on health information sharing intention through attitude does not exist. The results of social capital factors revealed that when people have better social relationships and social trust, closer interactions, or consistent shared visions/values, they are more open to sharing their obtained information.

Taking into account the user gratification theory and TPB model, Al-Ghaith (2018) documented that behavioral intention in TPB is a function of three determinants: attitude, subjective norm, and perceived behavior. In concordance with previous studies (Lin et al. 2018; Kim et al., 2018), the results for H1, H2, and H3 indicated that subjective norms, attitude, and perceived control exert a positive impact on health information sharing intention and sharing behavior. These results support recent findings that WeChat users who hold a more positive attitude toward sharing behavior feel more obligated to share, are more confident in using the sharing function on WeChat, and are more likely to engage in the behavior (Chen et al., 2018). We also examined the relationships among

entertainment, information seeking, and sharing intention through attitude. Results for H7 and H8 indicated that information seeking and entertainment are positively correlated with attitude, which is consistent with a prior study (Lien, 2014). Furthermore, mediated effects of entertainment and information seeking on health information sharing intention through attitude were found to exist.

6. CONCLUSION

6.1 Implications

From the academic perspective, there are several contributions. First, this study focused on the social media platform 'WeChat' and its users' health information sharing behavior. Previous studies have generally focused on social media platforms like Facebook and Twitter, which have a longer history and are popular in Western countries. Since WeChat has become the second most popular social media platform in the world, studying the health information sharing on WeChat opens a new window for researchers who are interested in social media in China or Asia. Although prior studies began evaluating knowledge sharing in online health communities (Yan et al., 2016; Deng & Liu, 2017), or exploring user behaviors of WeChat consumers (Gan, 2017; Chen, 2020), few studies have probed health information sharing through WeChat. Zhang et al. (2017) claimed that they performed the first quantitative investigation of people's view on health information in WeChat. In such circumstances, few studies focus on the model construct of health-related information sharing through WeChat. The findings of the study may not only enhance our knowledge of health information sharing on SNSs, but also prove a useful source of guidance for utilization (interaction) of health and social media.

Second, this study investigated the TPB model's feasibility in social media health information sharing. Our findings reveal that in the context of WeChat, subjective norms, attitude, and perceived behavioral control are predictors of health information sharing intention. The results also provide further support for the utility of the TPB with additional variables in predicting the mechanism of health information sharing behavior on social network sites. These findings are consistent with those of Bao et al. (2017) and Lin et al. (2018). Moreover, this study extends the TPB model by combining the social capital theory and user gratification theory, thus creating a new model for health information sharing and attempts to fill the research gaps in this field.

Third, previous studies separately used social capital theory (Li & Ye, 2014; Chung et al., 2016), user gratification theory (Gan & Li, 2017), and TPB models (Bao et al., 2017; Lin et al., 2018) to explore the information or knowledge sharing behavior of social media users. However, few studies have integrated these three theories to create new models to explain why and how people share health information on social media (especially on WeChat). Our study combined the three theories to explore the health information sharing behavior. We examined how social capital factors (social trust, shared visions, and social interaction) influence attitude, subjective norms, and health information sharing intention. The results revealed that all three factors exert a significant direct or indirect influence on health information sharing intention. Therefore, social recognition plays an important role in spreading health information on social media platforms like WeChat. Furthermore, we also examined factors from the user gratification theory and introduced attitudes into the mediation effects discussion, which contributes to a better understanding of impact prediction of health information sharing on social media.

Our findings also have practical implications for practitioners. First, sustainable use intention has been increasingly important in the context of intense competition among SNS providers. After browsing useful health information, people habitually share it in WeChat Group and WeChat Moments. Practitioners should pay more attention to the cultivation of health information sharing habits, especially among pioneer core users with certain diseases or incidents. Second, the results show that WeChat users often view health information sharing as a reciprocal process based on the belief that current information sharing will lead to future information acquisition. Furthermore, through sharing

health information on WeChat, users can participate in discussions and other interactions to feel happy and release stress, which leads to a more favorable evaluation of WeChat health information behavior. Additionally, existing information sharing habits make users hold a more positive attitude toward WeChat health information sharing. Therefore, when users have high entertainment and information seeking and are strongly habitual in their information sharing, they are more likely to use WeChat for sharing health information. These findings are very useful for WeChat practitioners to explore what factors are affecting WeChat users' attitudes when facing health information and how to lead the users to share health information.

6.2. Limitations and Future Research

This study has several limitations that leave open future research directions. First, the survey respondents were WeChat users in the Chinese mainland, which may limit the generalizability of the results, considering WeChat's popularity among Chinese around the world. Future studies should expand the sample size and survey users to different countries or areas. Second, the effects of group differences among WeChat users on health information sharing behavior were not taken into account. Scholars should further explore the health information sharing behaviors of specific groups. Third, with increasing concerns about social media privacy, users' information sharing behavior and trust issues could become more closely linked. Although our model involves social trust, this field also deserves more research and investment.

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APPENDIX A

Table 6. Construct Operational Definitions

Construct	Definition	Literature source
Subjective Norm	Individual's perceived social pressure to perform or not to perform a particular behavior.	Ajzen, 1991; Rodrigo et al., 2019
Attitude	An individual's favorable or unfavorable evaluation of performing a particular behavior.	Huang & Hsu, 2009
Perceived Behavioral Control	An individual's perceived ease or difficulty of performing a particular behavior	Ajzen, 1991
Social Trust	An individuals' beliefs and expectations that other members can perform consistent behaviors to follow norms and principles of a community.	Chang & Chuang, 2011
Shared Visions	Collective goals and aspirations which promote similar perceptions, mutual understanding and resource integration among WeChat users.	Inkpen & Tsang, 2005
Social Interaction	The level of frequency, time investment and relationship strength in member interactions.	Chiu et al., 2006
Entertainment	The degree (or way) by which shared health information helps users acquire entertainment value and escape pressure	Lee & Ma, 2012; Zhang et al., 2016
Information Seeking	The extent by which health information shared provide users with relevant, timely and useful information in this study.	Lee & Ma, 2012; Lien & Cao, 2014
Health Information Sharing Intention	The extent by which a user is willing to share health information sustainably on WeChat in this study.	Pi et al., 2013

APPENDIX B

Table 7. Constructs and Measurement Items

Constructs		Measurement items	Literature resource
Social Trust (ST)	ST1	I always trust my WeChat friends to lend me a hand if I need.	Chiu et al., 2006; Chow & Chan, 2008.
	ST2	I believe that my WeChat friends behave in a consistent manner.	
	ST3	I trust that my WeChat friends are truthful in dealing with one another.	
	ST4	I believe my WeChat friends will always try and help me out if I get into difficulty. (delete)	
	ST5	I believe that my WeChat friends keep their promises. (delete)	
Shared Visions (SV)	SV1	WeChat users share the vision of helping others solve their health-related problems.	Inkpen & Tsang, 2005
	SV2	My WeChat friends and I share the same ambitions and vision of sharing health information to others.	
	SV3	My WeChat friends and I are always enthusiastic about pursuing collective goals and missions.	
Social Interaction (SI)	SI1	I have very good relationships with my WeChat friends.	Chiu et al., 2006; Chow & Chan, 2008
	SI2	I am very close to my WeChat friends.	
	SI3	I spend considerable time interacting with WeChat friends.	
Entertainment (ENT)	ENT1	I have fun interacting and sharing with others on WeChat.	Hau & Kim, 2011.
	ENT2	Using WeChat for sharing health information provides me with a lot of enjoyment.	
	ENT3	I enjoy helping others through my health information sharing on WeChat.	
Information Seeking (IS)	IS1	I can get a large amount of health information quickly and easily.	Gao & Feng, 2016
	IS2	It helps me to get useful health information.	
	IS3	I can use it to collect health information for future use.	
Subjective Norms (SN)	SN1	People who are important to me think I should use WeChat for sharing health information.	Ajzen, 1991; Hosein et al., 2016.
	SN2	Most of the people around me think that using WeChat for sharing health information is a good life behavior.	
	SN3	The people around me encouraged and supported me to use WeChat for sharing health information.	
Attitude (ATT)	ATT1	I like sharing health information on WeChat.	Hsu & Lin, 2008.
	ATT2	I feel good about sharing health information on WeChat.	
	ATT3	Overall, my attitude toward sharing health information on WeChat is favorable. (delete)	
	ATT4	I strongly recommend that others share their health information on WeChat.	

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Table 7. Continued

Constructs		Measurement items	Literature resource
Perceived Behavioral Control (PBC)	PBC1	Using WeChat for sharing health information was entirely within my control. (delete)	Taylor & Todd, 1995.
	PBC2	I have the knowledge to use WeChat for sharing health information.	
	PBC3	I have the resources to use WeChat for sharing health information.	
	PBC4	I have the ability to use WeChat for sharing health information.	
	PBC5	I would be able to use WeChat well for sharing health information.	
Health Information Sharing Intention (HISI)	HISI1	I expect to share health information on WeChat.	Lee & Ma, 2012; Gan, 2017
	HISI2	I plan to share health information on WeChat.	
	HISI3	I share health information on WeChat to share something important.	
	HISI4	I share health information on WeChat to share something useful.	
	HISI5	I intend to share health information on WeChat in the future. (delete)	

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