

Association for Information Systems
AIS Electronic Library (AISeL)

DIGIT 2018 Proceedings

Diffusion Interest Group In Information
Technology

12-13-2018

An Identity Perspective on Online Healthcare Communities

Biyi Feng

Tsinghua University, fby15@mails.tsinghua.edu.cn

Xixi Li

Tsinghua University, ciciattsinghua@gmail.com

Lihui Lin

Tsinghua University, linlh@sem.tsinghua.edu.cn

Hongfei Gu

House086, hongfei@house086.com

Follow this and additional works at: <https://aisel.aisnet.org/digit2018>

Recommended Citation

Feng, Biyi; Li, Xixi; Lin, Lihui; and Gu, Hongfei, "An Identity Perspective on Online Healthcare Communities" (2018). *DIGIT 2018 Proceedings*. 8.

<https://aisel.aisnet.org/digit2018/8>

This material is brought to you by the Diffusion Interest Group In Information Technology at AIS Electronic Library (AISeL). It has been accepted for inclusion in DIGIT 2018 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

An Identity Perspective on Online Healthcare Communities

Completed Research Paper

Biyi Feng

Tsinghua University, Beijing, China
fby15@mails.tsinghua.edu.cn

Xixi Li

Tsinghua University, Beijing, China
ciciattsinghua@gmail.com

Lihui Lin

Tsinghua University, Beijing, China
linlh@sem.tsinghua.edu.cn

Hongfei Gu

House086, Beijing, China
hongfei@house086.com

Abstract

Online healthcare communities often experience high churn rates. Our study investigates this phenomenon by integrating the concepts of social stigma, psychological capital, and social identity. Based on survey data from an online community serving lymphoma patients, we found that 1) users' positive social identity increased their participation and recommendation intentions through enhanced psychological capital empowered by the online community; 2) stigmatized social identity hampered participation and recommendation intentions through decreased psychological capital; 3) users' personal identity moderated the mediated impacts of positive and stigmatized social identities on participation and recommendation intentions through psychological capital, and 4) participation intention positively influenced recommendation intention. Our study applied the identity theory with a novel approach and offered insights on the development and management of online healthcare communities for both researchers and practitioners.

Keywords: Social identity, online healthcare community, psychological capital, social stigma, technology use

An Identity Perspective on Online Healthcare Communities

Completed Research Paper

Introduction

Online healthcare communities play an important role in disease management, providing emotional support, peer-to-peer assistance, and clinical trials. For example, there are more than 140 online healthcare communities for cancer patients and their family members connected to the Association of Cancer Online Resources (Burstin et al. 2017). Online healthcare communities face many challenges in development and management, such as loss of active users, decreasing participation of users over time, and lack of new users (Wang et al. 2017). Indeed, patients diagnosed with chronic and/or severe diseases together with their close friends and family members experience drastic changes in both work and daily life. On the one hand, they are eager to become a member of such online communities and seek for information and emotional support from the powerful unified social groups (Yan and Tan 2014). On the other hand, they are hesitant to engage in such online communities because the diseases or disease-related social groups usually links to tainted or stigmatized social identity (Holland et al. 2010). Our study aims to answer two questions: 1) What are the different identities experienced by online healthcare community users? 2) How do these identities influence users' participation in and recommendation of online healthcare communities to others?

Online community is a research topic that has long been examined in the IS field. We identify several knowledge gaps with the extant literature. Firstly, most prior studies focused on general online communities, and very few have examined communities with unique characteristics such as online healthcare communities. For example, some scholars examined traditional online communities such as online bulletin boards, chat rooms, and online mailing lists (Butler et al. 2007; Dholakia et al. 2004). Some others investigated open source software communities (Fitzgerald 2006; Stewart and Gosain 2006). Recently, research attention started to shift toward online healthcare communities (Mein et al. 2016; Yan and Tan 2014). We consider online healthcare communities differ from traditional community groups because users of such communities are patients, or their close partners, friends, and caregivers who usually endure a very difficult time in life and therefore tend to experience identities and psychological states and display behaviors that are different from users of general online communities.

Secondly, previous studies on online communities usually applied a theoretical lens of social network and have seldom considered the influence of users' innate psychological factors on their usage intentions and behaviors. For example, some scholars investigated user commitment, i.e., social interactions of users and particular communities in affecting their engagement with online communities (Bateman et al. 2011; Joyce and Kraut 2006). Social capital theory is also a popular theoretical perspective understanding online community involvement, but is more comprehensive than the social network theory and further includes structural, cognitive, and relational aspects of social capital (Wasko and Faraj 2005). These studies based on the social network lens indeed offer insights on development and management of online communities in general. However, users from online healthcare communities usually experience identities linked with social stigma and tend to have anxious and desperate feelings during information exchange, which could be rare among users from the traditional online communities (Harkin et al. 2017). Therefore, we are interested in the identities and psychological states of users in affecting their participation in online healthcare communities.

In addition, the only two studies on online communities that adopted the identity theory usually confirmed the positive effect of social identity on user engagement with online communities and did not delineate the psychological mechanisms transmitting the influence of users' identities on their participation intentions and behaviors. Dholakia et al. (2004) found that group norms and social identity exerted a positive effect on users' desires to participate online communities. Ren et al. (2012) combined the identity concept and the bonding theory, and found that users' identity-based attachment positively affected their participation behavior in online communities. Nevertheless, as we have mentioned earlier, users of online healthcare communities experience ambivalent social identities. Specifically, the negative

social identity linked with social stigma surfaces the nuanced differences between online healthcare community users and healthy ones (Wright and Bell 2003). In other words, diseases signify the negative aspects of users' social identity and make them recall suffering time in the diagnosis and treatment processes, which not necessarily contributes to active involvement in online healthcare communities.

Targeting at the research questions and the knowledge gaps articulated above, we integrate the concepts of social stigma and psychological capital together with the identity theory and investigate users' participation and recommendation intentions in online healthcare communities. Our study contributes to the IS knowledge on online communities in three aspects. First, we approach online healthcare communities through the novel perspective of ambivalent social identities, bridging the emerging IS phenomenon with the social identity theory – a classic social psychology theory that is yet to receive in-depth understanding in the IS field. Second, we introduce the concept of psychological capital to the IS field and contextualize it as psychological capital empowered by online healthcare communities, thereby unlocking the influential mechanism of ambivalent social identities on user participation in and recommendation of online healthcare communities to others. Third, at both theoretical and methodological levels, we identify the moderating effects of users' personal identity associated with a certain disease on the indirect relationship between ambivalent social identities and user engagement through psychological capital.

In the following, we conceptualize three types of identities experienced by online healthcare community users - positive social identity and stigmatized social identity associated with online healthcare communities and unique personal identity associated with a disease. We then introduce and appropriate the concept of psychological capital into the context of online healthcare communities. We propose a moderated mediation model and test five research hypotheses with empirical data. Finally, we discuss the implications of the current findings for theory and practice and the next stage of our research project.

Theoretical Background

Participation and Recommendation Intentions in Online Healthcare Communities

Participation intention stands for users' intention to participate in online communities, e.g., sharing information with other members (Bagozzi and Dholakia 2002); recommendation intention refers to users' willingness to recommend a particular online community to their friends, colleagues, or whoever that encounters a need (Reichheld 2003). IS Scholars found that user participation plays a vital role in the contexts of customer relationship management using social media (Rishika et al. 2013), information systems implementation (Spears and Barki 2010), and crowdsourcing (Alam and Campbell 2017). Recommendation intention is also an important indicator of user satisfaction and web design effectiveness (Devaraj et al. 2002; Gorn et al. 2004). Similarly, in the marketing domain, consumers' participation and recommendation intentions signify their satisfaction with or loyalty to brands, products, or services (Apenes Solem 2016; Holland and Baker 2001; Williams and Naumann 2011). Some researchers even treated consumers' willingness to recommend a certain product as a proxy measure for customer loyalty (Eisingerich and Bell 2007; Reichheld 2003; Sirohi et al. 1998). Therefore, we target users' participation and recommendation intentions as the core focus of our study.

Ambivalent Social Identities and Unique Personal Identity

As argued earlier, users of online healthcare communities usually experience drastic changes in their work and daily life and experience identities that are different from the ones in online communities in general. According to the social identity theory, individuals possess both social identity and personal identity (Tajfel 1978). Social identity refers to individuals' self-concepts relating to their membership of certain social groups through self-categorization; personal identity refers to their self-concepts relating to their own idiosyncratic characteristics, traits, and personalities (Hewitt 1989). In most circumstances, individuals are intuitively motivated to attain and maintain a positive social identity (Tajfel and Turner 1986). Nevertheless, individuals would sometimes feel embarrassed and reluctant in face of some social groups that are stigmatized with by norms, beliefs, or diseases (Kreiner et al. 2006). Sociologists name the coexistence of positive and stigmatized social identity as the ambivalence of social identities (Lapointe

and Beaudry 2014). For example, the dirty work literature in management suggests that dirty workers are engaged in their work because they unify as a social group, share the group-based social identity, and believe dirty work jobs are meaningful for the society (Ashforth and Kreiner 1999). At the same time, social norms usually regard dirty workers as belong to a stigmatized social group, and such stigmatized social identity possibly discourages their work motivation (Kreiner et al. 2006). In other words, individuals' different social identities exert differential influences on their intentions and behaviors (Arbore et al. 2014; Tsai and Bagozzi 2014). The dirty work literature offers valuable insights on ambivalent social identities, but is yet to consider personal identity in juxtaposition with social identity.

In the context of online healthcare communities, users experience ambivalent social identities associated with the communities and unique personal identity associated with diseases. On the one hand, users identify with or feel good about an online healthcare community, since the community and its members provide encouragement and support in their tough experiences fighting against diseases, i.e., positive social identity. On the other hand, users are hesitant in face of the online healthcare community, as the community and its members share common difficulties with them and keep reminding the dark side in their lives, i.e., stigmatized social identity. In addition to the ambivalent social identities, users of online healthcare communities also experience unique personal identity associated with diseases such that the diseases make them feel distinctive and differentiate them from other people. We propose that the three conceptualized identities display comprehensive influences on user engagement with online healthcare communities, and we further bring in the notion of psychological capital to explain their influential mechanism.

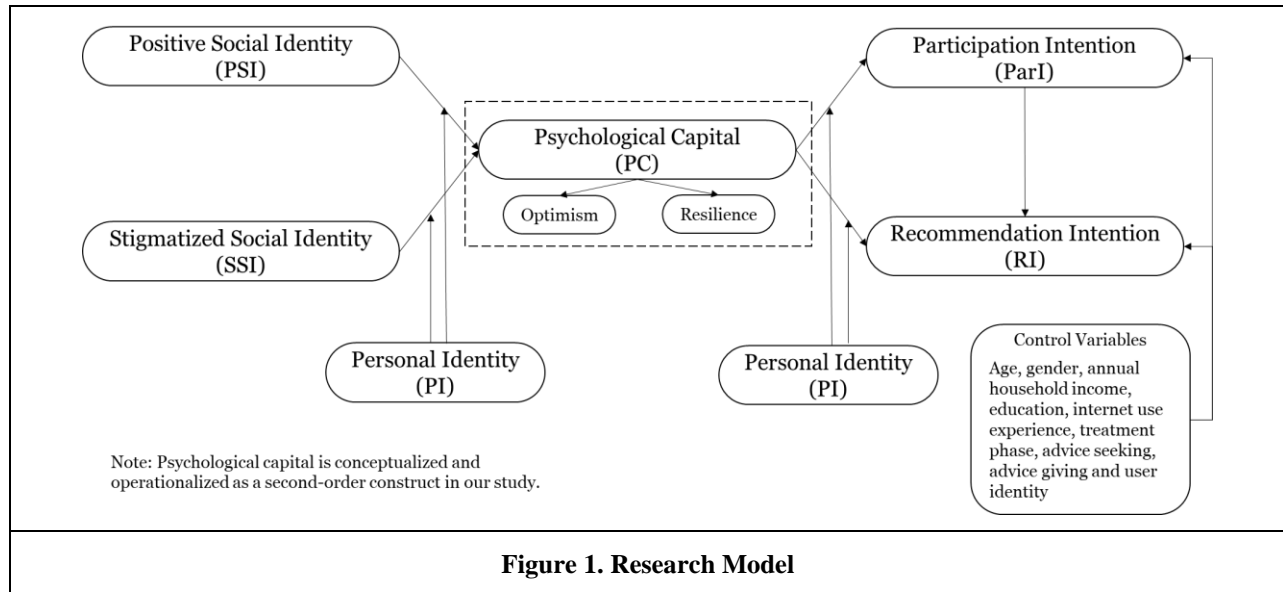
Psychological Capital Empowered by Online Healthcare Communities

Psychological capital, like financial capital and social capital, is a type of resource that individuals can utilize to attain advantageous statuses among certain population or in some difficult situations and is embedded in individuals' psychological state development (Luthans et al. 2007). Psychological capital firstly received research attention in the organizational context and is comprised of four dimensions, i.e., self-efficacy, hope, optimism, and resilience (Luthans et al. 2007). In the organizational context, self-efficacy refers to employees' confidence in their capability of overcoming difficulties in task performances. Hope stands for employees' belief in achieving task-related goals through designated pathways. Optimism means that employees stay positive in face of challenging tasks. Resilience means that employees, when encounter difficulties or frustrations, remain cheerful and strive for success again.

We adapt the concept of psychological capital into the context of online healthcare communities and conceptualize it as users' psychological capital empowered by online healthcare communities. We consider the two dimensions of optimism and resilience most appropriately capture users' psychological capital empowered by online healthcare communities. Optimism refers to the extent to which online healthcare communities help users remain positive and optimistic in front of difficulties experienced in their diagnosis and treatment processes; resilience refers to the extent to which online healthcare communities cheer them up and provide encouragement and support in their treatment processes. Meanwhile, users of online healthcare communities usually experience dramatic changes in their work and daily life. Even if online healthcare communities provide support in terms of empathy from peers, and useful information or connections to effective medicine and clinical trials, it would still take a very long time to rebuild users' confidence in and expectation of living a healthy life again. Therefore, we do not include self-efficacy and hope in our conceptualization of users' psychological capital empowered by online healthcare communities.

Research Model and Hypotheses

Figure 1 demonstrates our research model. We examine the mediation effects of users' psychological capital on the differential influences of positive and stigmatized social identities on their intentions to participate in and recommend online healthcare communities to others. We conceive users' psychological capital empowered by online healthcare communities as comprised of two reflective dimensions, optimism and resilience (Luthans et al. 2007). In addition, we examine the moderating effects of users' personal identity associated with diseases on the indirect relationships between ambivalent social identities and participation and recommendation intentions through psychological capital.



First, we propose that users’ psychological capital mediates the influence of positive social identity on their intentions to participate in and recommend of online healthcare communities to others. Individuals with a positive social identity associated with a certain social group tend to display affective commitment to the group and maintain positive relationships with other group members (Ellemers et al. 1999). In other words, positive social identity signifies individuals’ social bonding as well as satisfaction with the social group (Szreter and Woolcock 2004), which consequently motivates their participation intention in the group and willingness to talk about their group membership in front of others (Dholakia et al. 2004; Tsai and Bagozzi 2014).

In the context of online healthcare communities, users with a positive social identity associated with the communities would also be willing to identify with other members, share their experiences with them, and talk about their participations in the communities in front of their friends, colleagues, and family members (Ahearne et al. 2005). In addition, the positive social identity would motivate users acquire constructive information and become optimistic on their treatment processes. Users are more likely to obtain emotional support through communication with buddies they met online (Nigah et al. 2012), thereby remaining resilient in face of difficulties encountered during treatment. Such psychological capital gained from online healthcare communities further encourages users’ participation intention in and willingness to recommend the communities to others. Hence, we propose that

H1a: Positive social identity positively influences users’ participation intention through increasing their psychological capital empowered by the online healthcare community.

H1b: Positive social identity positively influences users’ recommendation intention through increasing their psychological capital empowered by the online healthcare community.

We theorize that users’ psychological capital mediates the influence of stigmatized social identity on their intentions of participation in and recommendation of online healthcare communities. Individuals with a stigmatized social identity would perceive themselves linked with a certain social group as negative. As a result, they would be hesitant when identifying with other members in the communities, less motivated to share with them personal feelings and useful information – a stigmatized social identity discourages individuals from participating and contributing to the “tainted” social group (Tajfel and Turner 1986). Moreover, individuals with a stigmatized social identity associated with the social group display a lower level of group self-esteem and would probably keep silent when discussing related topics in front of others (Ellemers et al. 1999).

In the context of online healthcare communities, users with a stigmatized social identity associated with the communities tend to interpret lower value connotation from their group membership, display lower emotional involvement, and be unwilling to receive support from other members of the communities (Ellemers et al. 1999). Since individuals with a lower level of self-esteem tend to be less resilient in face of

difficulties (Kumpfer 1999; Veselska et al. 2009), and become pessimistic without social support from peers (Symister and Friend 2003), users with a stigmatized social identity would experience decreased psychological capital attained from online healthcare communities. Consequently, the reduced psychological capital discourages users from participating in the communities and recommending them to others. Therefore, we propose that

H2a: Stigmatized social identity negatively influences users' participation intention through decreasing their psychological capital empowered by the online healthcare community.

H2b: Stigmatized social identity negatively influences users' recommendation intention through decreasing their psychological capital empowered by the online healthcare community.

We next explore the moderating effects of users' personal identity associated with a certain disease on the mediated relationships between ambivalent social identities and user engagement with online healthcare communities through psychological capital. As we have mentioned earlier, social identity primes similarities between an individual with other members of a certain social group, while personal identity emphasizes distinctions between him/her with others (Deschamps and Devos 1998). When an individual's personal identity associated with a certain disease is salient, s/he is likely to pay more attention to the differences between themselves and other individuals (Derks et al. 2006). In the context of online healthcare communities, users with a strong personal identity tend to think much of the difficulties that they experienced during treatment and would be otherwise hardly imagined by the healthy ones, and become struggled in face of optimistic sharing and emotional support from similar peers from the communities. In other words, a strong personal identity mitigates the influence of positive social identity on psychological capital, and subsequently on user engagement in online healthcare communities. Therefore, we propose

H3a: Personal identity negatively moderates the positive indirect impact of positive social identity on participation intention through psychological capital.

H3b: Personal identity negatively moderates the positive indirect impact of positive social identity on recommendation intention through psychological capital.

In addition, users with a strong personal identity, who always remind themselves as a patient or a caregiver of their beloved suffering ones, would like to stay alone instead of interacting with similar peers from the online healthcare communities. We argue that a strong personal identity displays a negative effect that is complementary to the influence of stigmatized social identity on psychological capital, as both of them make users of online healthcare communities keep distant from interacting with the ones who share similar disease-related difficulties and pains in both work and daily life. In other words, a strong personal identity strengthens the influence of stigmatized social identity on psychological capital. Subsequently, individuals with decreased psychological capital would be less active in participating in the online healthcare communities and hesitant to recommend the communities to others. Hence, we propose

H4a: Personal identity positively moderates the negative indirect impact of stigmatized social identity on participation intention through psychological capital.

H4b: Personal identity positively moderates the negative indirect impact of stigmatized social identity on recommendation intention through psychological capital.

Prior IS literature suggests that consumers' participation of e-commerce website design, e.g., personalization, leads to their satisfaction with and loyalty to the websites (Holland and Baker 2001), which then leads to their intentions to recommend the e-commerce websites to others (Kim et al. 2009). Likewise, employee participation leads to their job satisfaction (Bhatti and Qureshi 2007). Feeling satisfied with their jobs, employees are likely to recommend their organizations to friends as further employers (Koys 2001). Following similar lines of argument, in the online healthcare context, users' participation intention would exert a positive impact on their recommendation intention. Thus, we propose

H5: Users' participation intention positively influences their recommendation intention.

Method

We developed a survey instrument and collected data from one of the largest online healthcare communities in China, which serves lymphoma patients exclusively. This online community was established in 2011 and has approximately 56,000 members as of 2018, most of whom are patients and their family members and friends. We used the back-translation method (Brislin 1980) to develop the questionnaire in Chinese. All constructs adopted the Likert 5-point scale, ranging from 1 = “strongly disagree” to 5 = “strongly agree”. We adapted measures for participation intention from Bhattacharjee (2001) (3 items), recommendation intention from Wu and Sukoco (2010) (3 items), positive social identity (2 items), stigmatized social identity (3 items) and personal identity (3 items) from Ellemers et al. (1999), and optimism (2 items) and resilience (2 items) in psychological capital from Lorenz et al. (2016). We also controlled for user information including age, gender, annual household income, education, internet use experience, treatment phase, advice seeking, advice giving (Sykes et al. 2014), and user identity.

We first conducted semi-structured interviews and a pilot study with 20 users of the online community. The 20 participants confirmed that 1) they were proud to be a member of this online community and felt connected with other members; 2) they sometimes were hesitant when further interacting with other members and especially struggled when learning some members’ health conditions became worse; 3) the lymphoma disease differentiated them from healthy ones in both work and daily life and gave them a unique personal identity; and 4) the online community did offer much resource and encouragement to assist every member overcome difficulties and endure through treatment processes. The pilot study showed that the measures displayed acceptable psychometric properties and we further polished the items based on the feedback from the 20 participants. We formally administered the survey in one week from July 14th to July 21st, 2017. We obtained 271 valid responses from 277 participants, with 145 lymphoma patients and 126 friends and family members of lymphoma patients. Table 1 shows the sample demographics.

Feature	Attribute	Count	Percentage	Feature	Attribute	Count	Percentage
Age	≤20	2	0.74%	Annual Household Income (RMB)	<50,000	93	34.32%
	21-30	72	26.57%		50,000-100,000	84	31.00%
	31-40	92	33.95%		100,000-200,000	66	24.35%
	41-50	67	24.72%		200,000-500,000	23	8.49%
	51-60	26	9.59%		>500,000	5	1.85%
	>60	12	4.43%		Education	Primary School	3
Gender	Male	107	39.48%	Secondary School		72	26.57%
	Female	164	60.52%	College		61	22.51%
Internet Use Experience	<1 yr	10	3.69%	Bachelor		114	42.07%
	1-3 yrs	14	5.17%	Master/Doctor	21	7.75%	
	3-6 yrs	33	12.18%	Treatment Phase	Observation	13	4.80%
	6-10 yrs	75	27.68%		Treatment	119	43.91%
	>10 yrs	139	51.29%		Recovered	84	31.00%
Total	271	100.00%	Observation (Recurrence)		8	2.95%	
			Treatment (Recurrence)		47	17.34%	

Analysis and Results

First, we assessed the measurement model in Mplus 7 (Muthén and Muthén 2010) and obtained good model fit indices $\chi^2/df = 1.557$, CFI = 0.987, TLI=0.981, RMSEA =0.045, SRMR = 0.029 (Hu and Bentler 1999). Table 2 summarizes the details of psychometric properties of all constructs in the research model. Internal consistency was supported because the values of composite reliabilities were all higher than the recommended 0.70 (Nunnally 1994) and the square root of AVEs were all above 0.70 (Fornell and Larcker 1981). Discriminant validity was supported since the correlations among factors were smaller than the square root of average variance extracted (AVE) (Gefen and Straub 2005). Table 3 shows the item

loadings on principal constructs and the cross loadings on other constructs, where the differences between the item loadings and cross-loadings were all higher than the threshold (i.e., 0.2) (Gefen and Straub 2005). We also used three methods to check common method bias with our data, Harman’s single-factor test, marker variable (Lindell and Whitney 2001), and latent methods variance factor test (Podsakoff et al. 2003). The evidences collectively suggested that common method bias was not a major concern with our data.

	Mean	Standard Deviation	PSI	SSI	PI	PC	ParI	RI
PSI	4.304	0.578	0.901					
SSI	2.433	0.839	-0.176	0.783				
PI	2.895	1.017	0.043	0.116	0.900			
PC	4.232	0.595	0.649	-0.213	0.033	0.877		
ParI	4.410	0.619	0.575	-0.264	0.104	0.670	0.930	
RI	4.490	0.564	0.651	-0.229	0.031	0.597	0.564	0.961
Composite Reliability			0.896	0.823	0.927	0.930	0.951	0.973
Cronbach’s Alpha			0.769	0.686	0.935	0.900	0.922	0.959

Note: The diagonal elements are square root of AVEs; the off-diagonal elements are the correlations among factors. We operationalized psychological capital as a second-order construct with both levels as reflective in nature; Cronbach’s Alpha of the optimism and resilience dimensions of psychological capital are 0.914 and 0.867, respectively.
 PSI: Positive Social Identity, SSI: Stigmatized Social Identity, PI: Personal Identity,
 PC: Psychological Capital, ParI: Participation Intention, RI: Recommendation Intention

		PSI	SSI	PI	PC	ParI	RI
Positive Social Identity	PSI1	0.892	-0.145	0.096	0.554	0.482	0.580
	PSI2	0.910	-0.186	0.033	0.622	0.556	0.594
Stigmatized Social Identity	SSI1	-0.138	0.796	0.131	-0.117	-0.176	-0.231
	SSI2	-0.089	0.670	0.105	-0.162	-0.184	-0.083
	SSI3	-0.189	0.870	0.001	-0.224	-0.260	-0.227
Personal Identity	PI1	0.051	0.120	0.961	0.052	0.117	0.050
	PI2	0.064	0.058	0.946	0.045	0.130	0.059
	PI3	0.002	0.115	0.787	-0.017	0.046	-0.021
Psychological Capital (PC)	Optimism1	0.610	-0.225	0.006	0.887	0.576	0.523
	Optimism2	0.599	-0.168	0.035	0.891	0.542	0.543
	Resilience1	0.512	-0.181	0.049	0.852	0.586	0.490
	Resilience2	0.570	-0.192	0.132	0.877	0.644	0.543
Participation Intention	ParI1	0.502	-0.300	0.135	0.574	0.918	0.507
	ParI2	0.532	-0.202	0.116	0.609	0.937	0.526
	ParI3	0.575	-0.250	0.141	0.680	0.936	0.539
Recommendation Intention	RI1	0.641	-0.235	0.066	0.604	0.531	0.959
	RI2	0.622	-0.227	0.083	0.567	0.539	0.958
	RI3	0.616	-0.231	0.055	0.553	0.556	0.966

We then applied SmartPLS 3.0 (Ringle et al. 2015) to test the simple mediation and moderated mediation models (Tables 4 and 5). In Table 4, positive social identity had significant positive effects on psychological capital ($\beta = 0.635$, $p < 0.001$), participation intention ($\beta = 0.218$, $p = 0.008$), and recommendation intention ($\beta = 0.415$, $p < 0.001$). Stigmatized social identity had significant negative effects on psychological capital ($\beta = -0.101$, $p = 0.033$), participation intention ($\beta = -0.124$, $p = 0.009$), and recommendation intention ($\beta = -0.084$, $p = 0.048$). Psychological capital had significantly positive effects on participation intention ($\beta = 0.481$, $p < 0.001$) and recommendation intention ($\beta = 0.205$, $p = 0.009$). Participation intention had a significant positive effect on recommendation intention ($\beta = 0.177$, $p = 0.016$).

	Psychological Capital (PC)	Participation Intention (ParI)	Recommendation Intention (RI)
Positive Social Identity (PSI)	0.635*** (0.000)	0.218** (0.008)	0.415*** (0.000)
Stigmatized Social Identity (SSI)	- 0.101* (0.033)	- 0.124** (0.009)	- 0.084* (0.048)
PC		0.481*** (0.000)	0.205** (0.009)
ParI			0.177* (0.016)
R ²	43.7%	50.6%	51.0%

Note: Standardized path coefficients and p-values within parentheses are reported.
 *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, one-tailed tests are performed as directional hypotheses are theorized.

In Table 5, the interaction term of positive social identity and personal identity had a significant negative effect on psychological capital ($\beta = -0.094$, $p = 0.048$), while the interaction term of stigmatized social identity and personal identity had a significantly positive effect on psychological capital ($\beta = 0.176$, $p < 0.001$). The interaction term of psychological capital and personal identity had a significant negative effect on participation intention ($\beta = -0.113$, $p = 0.010$), whereas the interaction term of psychological capital and personal identity did not have a significant effect on recommendation intention ($\beta = -0.079$, $p = 0.054$). In both simple mediation and moderated mediation models, the variance inflation factors (VIFs) ranged from 1 to 3, lower than the cutoff level of 10.0 (Hair et al. 1998).

	Psychological Capital (PC)	Participation Intention (ParI)	Recommendation Intention (RI)
Positive Social Identity (PSI)	0.602*** (0.000)	0.218** (0.006)	0.415*** (0.000)
Stigmatized Social Identity (SSI)	- 0.154** (0.003)	- 0.124** (0.008)	- 0.084 (0.053)
Personal Identity (PI)	0.053 (0.141)		
PC		0.481*** (0.000)	0.205** (0.010)
ParI			0.177* (0.017)
PSI x PI	- 0.094* (0.048)		
SSI x PI	0.176*** (0.000)		
PC x PI		-0.113** (0.010)	-0.079 (0.054)
R ²	48.7%	53.2%	51.8%

Note: Standardized path coefficients and p-values within parentheses are reported.
 *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, one-tailed tests are performed as directional hypotheses are theorized.

We also statistically examined the mediation and moderated mediation effects by PROCESS macro in SPSS (Hayes 2015). Table 6 presents the summary of findings. The indirect effects of positive social identity on participation intention ($\beta = 0.218$; CI: [0.079, 0.371]) and recommendation intention ($\beta =$

0.415; CI: [0.298, 0.557]) through psychological capital were significant, supporting H1a and H1b. The indirect effect of stigmatized social identity on participation intention ($\beta = -0.124$; CI: [-0.212, -0.038]) and recommendation intention ($\beta = -0.084$; CI: [-0.165, -0.003]) through psychological capital were significant, supporting H2a and H2b. In addition, whenever personal identity is low or high, it negatively moderated the indirect effect of positive social identity on participation intention (index = -0.055; CI: [-0.121, -0.003]) and recommendation intention (index = 0.164; CI: [0.114, 0.215]) through psychological capital, supporting H3a and H3b. Personal identity positively moderated the indirect effect of stigmatized social identity on participation intention (index = 0.193; CI: [0.105, 0.309]) and recommendation intention (index = 0.177; CI: [0.105, 0.256]) through psychological capital when personal identity is low, partially supporting H4a and H4b. Finally, in Table 5 participation intention had a significant positive effect on recommendation intention ($\beta = 0.177$, $p < 0.05$), supporting H5.

Table 6. Summary of Findings

Independent Variables	Dependent Variables	Coefficient	Bias-corrected 95% confidence interval (CI)		Hypotheses		
			Lower	Upper			
Mediation test results							
		Indirect effect through Psychological Capital (PC)					
PSI	ParI	0.218	0.079	0.371	H1a	√	
PSI	RI	0.415	0.298	0.557	H1b	√	
SSI	ParI	-0.124	-0.212	-0.038	H2a	√	
SSI	RI	-0.084	-0.165	-0.003	H2b	√	
Moderated mediation test results							
		Conditional indirect effect through Psychological Capital (PC)					
PSI	ParI	Low PI	0.358	0.220	0.584	H3a	√
		High PI	0.255	0.154	0.413		
		<i>Index of moderated mediation</i>					
			-0.055	-0.121	-0.003		
PSI	RI	Low PI	-0.197	-0.260	-0.135	H3b	√
		High PI	0.111	0.042	0.195		
		<i>Index of moderated mediation</i>					
			0.164	0.114	0.215		
SSI	ParI	Low PI	-0.412	-0.631	-0.267	H4a	√
		High PI	-0.050	-0.167	0.049		
		<i>Index of moderated mediation</i>					
			0.193	0.105	0.309		
SSI	RI	Low PI	-0.378	-0.527	-0.262	H4b	√
		High PI	-0.046	-0.152	0.046		
		<i>Index of moderated mediation</i>					
			0.177	0.105	0.256		
Note: Standardized path coefficients are reported; We used 1000 bootstrap resamples to conduct mediation test. PSI: Positive Social Identity, SSI: Stigmatized Social Identity, PI: Personal Identity, PC: Psychological Capital, ParI: Participation Intention, RI: Recommendation Intention							

Discussion

Implications for Theory

Our study advances the IS knowledge on online healthcare communities in the following aspects. First, we interpret users' participation and recommendation intentions of online healthcare communities through the social identity theory. We are among the first to introduce both positive and negative aspects of social identities, integrate these identity concepts with the notion of social stigma, and provide nuanced understanding on how different social identities affect user behaviors in online healthcare communities. Prior IS studies usually approach online communities through the lens of social network, e.g., user commitment (Bateman et al. 2011; Joyce and Kraut 2006), group norms (Dholakia et al. 2004, Stewart and Gosain 2006), and social capital (Wasko and Faraj 2005; Xia et al. 2012), etc. The handful studies draw on the social identity theory confirmed only the positive influence of social identity on user engagement with online communities (Dholakia et al. 2004; Ren et al. 2012). Our study highlights the unique characteristics of online healthcare communities - users usually experience ambivalent social identities, which might simultaneously encourage and discourage their involvement with the online healthcare communities. Our study paves a new way for future studies that are interested how user identities affect the management and development of online communities.

Second, we introduce the concept of psychological capital from positive psychology (Luthans et al. 2007; Nigah et al. 2012) and appropriate it as psychological capital empowered by online healthcare communities in the IS context. As we have argued in the previous point, prior IS studies usually approach online communities through the social network perspective, and therefore can offer limited insights on the psychological mechanisms of external factors' influence on user behaviors of online communities. The construct of psychological capital in our study especially conceptualize the important roles of online healthcare communities play in enhancing users' optimism and resilience, thereby motivating their participation and involvement in the communities. The mediating effects of psychological capital as delineated in our findings unlock the black box of the psychological states of users with different types of social identities as well as the psychological states of users with different engagement intentions and behaviors in online healthcare communities.

Third, we further explore the moderating influence of users' personal identity associated with a certain disease on the indirect relationships between ambivalent social identities and user engagement with online healthcare communities through psychological capital. The social identity theory suggests that identity is a multi-level concept, including both social identity and personal identity (Ashforth et al. 2011). We incorporate both social identity and personal identity in our research model (Deschamps and Devos 1998), though we operationalized both constructs at the individual level. As such, our findings also contribute to the social identity theory and provide contextualized interpretation on the influences of social identity, personal identity, as well as the interactional relation between social and personal identity in online healthcare communities. Methodologically, we are one of the first studies to bring in the moderated mediation analysis technique (Hayes 2015) into the IS context.

Implications for Practice

Our findings provide several practical implications for management and development of online healthcare communities. First, founders or managers of online healthcare communities should allocate efforts and resources to build a unified positive social identity that are associated with their communities, so that users will be motivated to engage with the community interactions. For example, online healthcare communities can make stories on how star members experience changes in their work and daily life before and after joining their communities (Ahearne et al. 2005). The communities can also invite these "stars" to share their own stories or even meet new comers in person on a regular basis. Second, online healthcare communities should pay attention to the negative effects of stigmatized social identity and individual characteristics as a unique person linked with particular healthcare issues. For instance, online healthcare communities can set up teams and monitor the content of social interactions among community members online, and take prompt actions to screen out negative or controversial inputs (Luyckx et al. 2011). Third, online healthcare communities should also enrich the official content they provide in the online platforms or social interactions among members with a specific focus on building up users' optimism and resilience toward their own lives (Luthans et al. 2008).

Limitations and Future Research

Our study has several limitations and provides opportunities for future research. First, we used self-reported data to test our research model. We will conduct field experiments in next step of our research project and further examine the causal relationships in our research model. Specifically, we will create conditions to manipulate the different types of identities, including positive social identity, stigmatized social identity, and personal identity, and examine how the different identities influence user engagement with online communities. Second, our survey design was cross-sectional, and examined user intentions of participation and recommendation as proxy measures of their actual behaviors. In the future study, we will consider longitudinal research designs to assess users' participation and recommendation behaviors in both subjective and objective ways and also to track how the participation and recommendation behaviors evolve over time along with changes in their perceived identities and psychological states. Third, in addition to the online healthcare communities, we plan to cross-validate our research model and findings in other stigmatized or marginalized online community groups.

Conclusion

Our study investigates user engagement in an online community serving lymphoma patients through an identity perspective. Positive social identity encouraged user participation and recommendation intentions through increasing their psychological capital empowered by the online community, while stigmatized social identity discouraged users' participation and recommendation intentions through decreasing their psychological capital. Moreover, users' personal identity negatively moderated the positive indirect impact of positive social identity on participation and recommendation intention, and positively moderated the negative indirect impact of stigmatized social identity. Our study brings in the concepts of social stigma and psychological capital to the IS field and provides nuanced understanding on how users' different types of identities associated with online healthcare communities influence community development and management.

Acknowledgments

We are grateful to the financial support from the National Natural Science Foundation of China (Grants 71701110, 71432004, 71372052, and 71490721).

References

- Ahearne, M., Bhattacharya, C. B., and Gruen, T. 2005. "Antecedents and Consequences of Customer-Company Identification: Expanding the Role of Relationship Marketing," *Journal of Applied Psychology* (90:3), pp. 574-585.
- Alam, S. L., and Campbell, J. 2017. "Temporal Motivations of Volunteers to Participate in Cultural Crowdsourcing Work," *Information Systems Research* (28:4), pp. 744-759.
- Apenes Solem, B. A. 2016. "Influences of Customer Participation and Customer Brand Engagement on Brand Loyalty," *Journal of Consumer Marketing* (33:5), pp. 332-342.
- Arbore, A., Soscia, I., and Bagozzi, R. P. 2014. "The Role of Signaling Identity in the Adoption of Personal Technologies," *Journal of the Association for Information Systems* (15:2), pp. 86-110.
- Ashforth, B. E., and Kreiner, G. E. 1999. "'How Can You Do It?': Dirty Work and the Challenge of Constructing a Positive Identity," *Academy of Management Review* (24:3), pp. 413-434.
- Ashforth, B. E., Rogers, K. M., and Corley, K. G. 2011. "Identity in Organizations: Exploring Cross-Level Dynamics," *Organization Science* (22:5), pp. 1144-1156.
- Bagozzi, R. P., and Dholakia, U. M. 2002. "Intentional Social Action in Virtual Communities," *Journal of Interactive Marketing* (16:2), pp. 2-21.
- Bateman, P. J., Gray, P. H., and Butler, B. S. 2011. "Research Note - The Impact of Community Commitment on Participation in Online Communities," *Information Systems Research* (22:4), pp. 841-854.
- Bhattacharjee, A. 2001. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3), pp. 351-370.

- Bhatti, K. K., and Qureshi, T. M. 2007. "Impact of Employee Participation on Job Satisfaction, Employee Commitment and Employee Productivity," *International Review of Business Research Papers* (3:2), pp. 54-68.
- Brislin, R. W. 1980. "Translation and Content Analysis of Oral and Written Material," in *Handbook of Cross-Cultural Psychology: Methodology*, H. Triandis, and J. Berry (eds.), Boston, MA: Allyn and Bacon, pp. 389-444.
- Burstin, H., Cobb, K., McQueston, K., Paget, L., Cella, D., McCaffrey, S., Eaneff, S., and Chiauzzi, E. 2017. "Measuring What Matters to Patients: Innovations in Integrating the Patient Experience into Development of Meaningful Performance Measures," National Quality Forum.
- Butler, B., Sproull, L., Kiesler, S., and Kraut, R. 2007. "Community Effort in Online Groups: Who Does the Work and Why," in *Leadership at a Distance: Research in Technologically Supported Work*, S. P. Weisband (ed.), Mahwah, NJ: Lawrence Erlbaum, pp. 171-194.
- Derks, B., van Laar, C., and Ellemers, N. 2006. "Striving for Success in Outgroup Settings: Effects of Contextually Emphasizing Ingroup Dimensions on Stigmatized Group Members' Social Identity and Performance Styles," *Personality and Social Psychology Bulletin* (32:5), pp. 576-588.
- Deschamps, J. C., and Devos, T. 1998. "Regarding the Relationship Between Social Identity and Personal Identity," in *Social Identity: International Perspectives*, S. Worchel, J. F. Morales, D. Páez, and J.-C. Deschamps (eds.), Thousand Oaks, CA, US: Sage Publications, pp. 1-12.
- Devaraj, S., Fan, M., and Kohli, R. 2002. "Antecedents of B2C Channel Satisfaction and Preference: Validating E-commerce Metrics," *Information Systems Research* (13:3), pp. 316-333.
- Dholakia, U. M., Bagozzi, R. P., and Pearo, L. K. 2004. "A Social Influence Model of Consumer Participation in Network- and Small-Group-Based Virtual Communities," *International Journal of Research in Marketing* (21:3), pp. 241-263.
- Eisingerich, A. B., and Bell, S. J. 2007. "Maintaining Customer Relationships in High Credence Services," *Journal of Services Marketing* (21:4), pp. 253-262.
- Ellemers, N., Kortekaas, P., and Ouwerkerk, J. W. 1999. "Self-Categorization, Commitment to the Group and Social Self-Esteem as Related but Distinct Aspects of Social Identity," *European Journal of Social Psychology* (29:23), pp. 371-389.
- Fitzgerald, B. 2006. "The Transformation of Open Source Software," *MIS Quarterly* (30:3), pp. 587-598.
- Fornell, C., and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:1), pp. 39-50.
- Gefen, D., and Straub, D. 2005. "A Practical Guide to Factorial Validity Using PLS-Graph: Tutorial and Annotated Example," *Communications of the Association for Information Systems* (16:1), pp. 91-109.
- Gorn, G. J., Chattopadhyay, A., Sengupta, J., and Tripathi, S. 2004. "Waiting for the Web: How Screen Color Affects Time Perception," *Journal of Marketing Research* (41:2), pp. 215-225.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R.E., and Tatham, R. L. 1998. *Multivariate Data Analysis*, Upper Saddle River, NJ: Prentice hall.
- Harkin, L. J., Beaver, K., Dey, P., and Choong, K. 2017. "Navigating Cancer Using Online Communities: A Grounded Theory of Survivor and Family Experiences," *Journal of Cancer Survivorship* (11:6), pp. 658-669.
- Hayes, A. F. 2015. "An Index and Test of Linear Moderated Mediation," *Multivariate Behavioral Research* (50:1), pp. 1-22.
- Hewitt, J. P. 1989. *Dilemmas of the American Self*, Philadelphia: Temple University Press.
- Holland, J. C., Kelly, B. J., and Weinberger, M. I. 2010. "Why Psychosocial Care is Difficult to Integrate into Routine Cancer Care: Stigma is the Elephant in the Room," *Journal of the National Comprehensive Cancer Network* (8:4), pp. 362-366.
- Holland, J., and Baker, S. M. 2001. "Customer Participation in Creating Site Brand Loyalty," *Journal of Interactive Marketing* (15:4), pp. 34-45.
- Hu, L., and Bentler, P. M. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling: A Multidisciplinary Journal* (6:1), pp. 1-55.
- Joyce, E., and Kraut, R. E. 2006. "Predicting Continued Participation in Newsgroups," *Journal of Computer-Mediated Communication* (11:3), pp. 723-747.
- Kim, D. J., Ferrin, D. L., and Rao, H. R. 2009. "Trust and Satisfaction, Two Stepping Stones for Successful E-commerce Relationships: A Longitudinal Exploration," *Information Systems Research* (20:2), pp. 237-257.

- Koys, D. J. 2001. "The Effects of Employee Satisfaction, Organizational Citizenship Behavior, and Turnover on Organizational Effectiveness: A Unit-Level, Longitudinal Study," *Personnel Psychology* (54:1), pp. 101-114.
- Kreiner, G. E., Ashforth, B. E., and Sluss, D. M. 2006. "Identity Dynamics in Occupational Dirty Work: Integrating Social Identity and System Justification Perspectives," *Organization Science* (17:5), pp. 619-636.
- Kumpfer, K. L. 1999. "Factors and Processes Contributing to Resilience: The Resilience framework," in *Resiliency and Development: Positive Life Adaptations*, M. D. Glantz and J. L. Johnson (eds.), New York: Kluwer Academic, pp. 179-224.
- Lapointe, L., and Beaudry, A. 2014. "Identifying IT User Mindsets: Acceptance, Resistance, and Ambivalence," in *Proceedings of the 47th Hawaii International Conference on System Sciences*, Waikoloa, HI, USA, pp. 4619-4628.
- Lindell, M. K., and Whitney, D. J. 2001. "Accounting for Common Method Variance in Cross-Sectional Research Designs," *Journal of Applied Psychology* (86:1), pp. 114-121.
- Lorenz, T., Beer, C., Pütz, J., and Heinitz, K. 2016. "Measuring Psychological Capital: Construction and Validation of the Compound PsyCap Scale (CPC-12)," *PLoS One* (11:4), p. e0152892.
- Luthans, F., Norman, S. M., Avolio, B. J., and Avey, J. B. 2008. "The Mediating Role of Psychological Capital in the Supportive Organizational Climate—Employee Performance Relationship," *Journal of Organizational Behavior* (29:2), pp. 219-238.
- Luthans, F., Youssef, C. M., and Avolio, B. J. 2007. *Psychological Capital: Developing the Human Competitive Edge*, Oxford: Oxford University Press.
- Luyckx, K., Schwartz, S. J., Goossens, L., Beyers, W., and Missotten, L. 2011. "Processes of Personal Identity Formation and Evaluation," in *Handbook of Identity Theory and Research*, S. J. Schwartz, K. Luyckx, and V. L. Vignoles (eds.), New York, NY: Springer, pp. 77-98.
- Mein, G. J., Gao, G., and Agarwal, R. 2016. "The Creation of Social Value: Can an Online Health Community Reduce Rural–Urban Health Disparities?," *MIS Quarterly* (40:1), pp. 247-263.
- Muthén, L. K., and Muthén, B. O. 2010. *Mplus User's Guide*, Los Angeles: Muthén and Muthén.
- Nigah, N., Davis, A. J., and Hurrell, S. A. 2012. "The Impact of Buddying on Psychological Capital and Work Engagement: An Empirical Study of Socialization in the Professional Services Sector," *Thunderbird International Business Review* (54:6), pp. 891-905.
- Nunnally, J. C. 1994. *Psychometric Theory*, MacGraw-Hill, New York: McGraw-Hill.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., and Podsakoff, N. P. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), pp. 879-903.
- Reichheld, F. F. 2003. "The One Number You Need to Know to Grow," *Harvard Business Review* (81:12), pp. 46-54.
- Ren, Y., Harper, F. M., Drenner, S., Terveen, L., Kiesler, S., Riedl, J., and Kraut, R. E. 2012. "Building Member Attachment in Online Communities: Applying Theories of Group Identity and Interpersonal Bonds," *MIS Quarterly* (36:3), pp. 841-864.
- Ringle, C. M., Wende, S., and Becker, J. M. 2015. *SmartPLS 3*, Bönningstedt, Germany: SmartPLS.
- Rishika, R., Kumar, A., Janakiraman, R., and Bezawada, R. 2013. "The Effect of Customers' Social Media Participation on Customer Visit Frequency and Profitability: An Empirical Investigation," *Information Systems Research* (24:1), pp. 108-127.
- Sirohi, N., McLaughlin, E. W., and Wittink, D. R. 1998. "A Model of Consumer Perceptions and Store Loyalty Intentions for a Supermarket Retailer," *Journal of Retailing* (74:2), pp. 223-245.
- Spears, J. L., and Barki, H. 2010. "User Participation in Information Systems Security Risk Management," *MIS Quarterly* (34:3), pp. 503-522.
- Stewart, K. J., and Gosain, S. 2006. "The Impact of Ideology on Effectiveness in Open Source Software Development Teams," *MIS Quarterly* (30:2), pp. 291-314.
- Sykes, T. A., Venkatesh, V., and Johnson, J. L. 2014. "Enterprise System Implementation and Employee Job Performance: Understanding the Role of Advice Networks," *MIS Quarterly* (38:1), pp. 51-72.
- Symister, P., and Friend, R. 2003. "The Influence of Social Support and Problematic Support on Optimism and Depression in Chronic Illness: A Prospective Study Evaluating Self-Esteem as a Mediator," *Health Psychology* (22:2), pp. 123-129.
- Szreter, S., and Woolcock, M. 2004. "Health by Association? Social Capital, Social Theory, and the Political Economy of Public Health," *International Journal of Epidemiology* (33:4), pp. 650-667.

- Tajfel, H. 1978. "Social Categorization, Social Identity and Social Comparison," *Differentiation Between Social Group* (24:1), pp.285-295.
- Tajfel, H., and Turner, J. C. 1986. "The Social Identity Theory of Intergroup Behavior," *Political Psychology* (13:3), pp. 7-24.
- Tsai, H. T., and Bagozzi, R. P. 2014. "Contribution Behavior in Virtual Communities: Cognitive, Emotional, and Social Influences," *MIS Quarterly* (38:1), pp. 143-164.
- Veselska, Z., Geckova, A. M., Orosova, O., Gajdosova, B., van Dijk, J. P., and Reijneveld, S. A. 2009. "Self-Esteem and Resilience: The Connection with Risky Behavior Among Adolescents," *Addictive Behaviors* (34:3), pp. 287-291.
- Wang, X., Zhao, K., and Street, N. 2017. "Analyzing and Predicting User Participations in Online Health Communities: A Social Support Perspective," *Journal of Medical Internet Research* (19:4), p. e130.
- Wasko, M. M. L., and Faraj, S. 2005. "Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice," *MIS Quarterly* (29:1), pp. 35-57.
- Williams, P., and Naumann, E. 2011. "Customer Satisfaction and Business Performance: A Firm-Level Analysis," *Journal of Services Marketing* (25:1), pp. 20-32.
- Wright, K. B., and Bell, S. B. 2003. "Health-Related Support Groups on the Internet: Linking Empirical Findings to Social Support and Computer-Mediated Communication theory," *Journal of Health Psychology* (8:1), pp. 39-54.
- Wu, W. Y., and Sukoco, B. M. 2010. "Why Should I Share? Examining Consumers' Motives and Trust on Knowledge Sharing," *Journal of Computer Information Systems* (50:4), pp. 11-19.
- Xia, M., Huang, Y., Duan, W., and Whinston, A. B. 2012. "Research Note - To Continue Sharing or Not to Continue Sharing? An Empirical Analysis of User Decision in Peer-to-Peer Sharing Networks," *Information Systems Research* (23:1), pp. 247-259.
- Yan, L., and Tan, Y. 2014. "Feeling Blue? Go Online: An Empirical Study of Social Support Among Patients," *Information Systems Research* (25:4), pp. 690-709.

Appendix A

Table A1. Summary of Measures		
Construct	Measures	Source
Positive Social Identity	As a member of XXX, PSI1. I feel good about XXX. PSI2. I identify with other members of XXX.	Ellemers et al. 1999
Stigmatized Social Identity	As a member of XXX, SSI1. I would rather not tell that I belong to XXX. SSI2. I dislike being a member of XXX. SSI3. Compared to XXX, I would rather tell that I belong to another online group	Ellemers et al. 1999
Personal Identity	As a lymphoma patient/close friend of a lymphoma patient/family member of a lymphoma patient, PI1. I feel myself as someone with individual characteristics. PI2. I think I am different from other people. PI3. I feel like a unique person.	Ellemers et al. 1999
Psychological Capital	Optimism1. XXX made me look forward to the life ahead. Optimism2. XXX made me believe that the future holds a lot of good in store for me. Resilience1. With the help and support from XXX, I make myself follow the treatment plan whether I want to or not. Resilience2. With the help and support from XXX, I can usually find a way out in a difficult situation during the treatment process.	Lorenz et al. 2016
Participation Intention	ParI1. I intend to participate in XXX in the next 3 months. ParI2. I am willing to participate in XXX the next 3 months. ParI3. If I encounter similar symptoms next time, I will continue my use of XXX.	Bhattacharjee 2001; Ray et al. 2014
Recommendation Intention	RI1. If my family members have needs, I will recommend XXX to them. RI2. If my colleagues or friends have needs, I will recommend XXX to them. RI3. If there is a suitable chance, I will recommend XXX to other patients or in-patient roommates.	Wu and Sukoco 2010