

## Motivating Online Social Support Provision to Patients with Complex Chronic Diseases: A Technological-Affordance Approach

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**Peer review:** This article has been subject to a double-blind peer review process



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### Abstract

*This study examines the topic of motivating social support provision for patients with complex chronic diseases (CCD) from a technological-affordance approach. Utilizing an online survey (N = 281) of patients with Irritable Bowel Syndrome (IBS), this study shows that certain technological affordances of computer-mediated technologies could trigger psychological reactions, which then drive social support provision for IBS patients in online health communities. Community building significantly promotes support provision by enhancing one's sense of community, and so does agency building via improving one's self-agency. In addition, browsing significantly promotes social support provision as individuals are more likely to be exposed to emotional support-seeking messages when technology allows users to freely move through and obtain information. As a result, they are more inclined to offer support in response. Theoretical and practical implications are discussed.*

**Keywords:** social support; community building; agency enhancement; browsing; emotion

## Introduction

People often seek social support when facing stressful situations (Burleson & MacGeorge, 2002). It is especially crucial to individuals who are living with distress (Coulson, Buchanan & Aubeeluck, 2007; Greene, Choudhry, Kilabuk & Shrank, 2011; Mo & Coulson, 2012; White & Dorman, 2001) – for example, an incurable, complex chronic disease (CCD) like Irritable Bowel Syndrome (IBS). IBS is an abnormality in one's abdomen, characterized by abdominal pain and irregular bowel movement, including constipation and/or diarrhea. IBS patients do not only suffer chronic psychical pain such as fibromyalgia, but they are also at a greater risk of psychiatric disorders like depression, anxiety, and somatization often associated with poor quality of life (Chey, Kurlander, & Eswaran, 2015).

While IBS affects around 10-15% of the U.S. population (Hungin et al., 2003, 2005; Perry et al., 2005), its pathophysiology remains poorly understood and a clinical challenge. Many current treatment options are not strongly supported by high-quality empirical studies (Ford et al., 2014). IBS patients feel frustration on a daily basis (AGA, 2015), as being aware of various IBS symptoms significantly reduces their willingness to share their conditions or to engage in social interactions with others. As a result, IBS patients often have to rely on social support, ranging from simply acquiring information to managing IBS symptoms (e.g., diet and medication) to seeking emotional comfort that helps them get through difficult times. The proliferation of computer-mediated technologies, such as online health forums, opens up promises for patients with CCD to connect to peers with similar experiences for informational, emotional, and even tangible social support (Coulson, 2005).

While having quality social support is crucial to patients with CCD in sustaining their daily lives, little, unfortunately, has been known as to what motivates people to provide social support online. Most studies have looked at social support *reception* (that is, receiving the social support) instead of social support *provision* (that is, providing social support) in the online context. Within the limited literature, the majority focuses on the personal and social motives for social provision (Beenen et al., 2004; Ciffolilli, 2003; Heyman & Ariely, 2004; Jian & Jeffres, 2006; Jung, 1990; Kollock, 1999; Ling et al., 2005; McMillan, 1996; Walster, Walster, & Berscheid, 1978), only a small yet growing number of scholarship has highlighted the role of technology in driving online social support provision. Preece, Nonnecke, and Andrews (2004) conducted an online survey of 1,188 users of 375 MSN bulletin communities and found that one of the top

reasons why people chose to lurk (i.e., passively viewing content) rather than contributing content online was the poor usability of the interface design (for example, not being able to make a software work online) of these virtual communities. Thus, various technological affordances online could also serve as cues, activating psychological motives for offering social support.

This research takes a technological-affordance approach to social support provision for individuals living with CCD, examining how technological features can serve as drivers for promoting individuals to support others. Findings from this research could contribute to the existing literature by exploring the role of new communicative technologies for social support provision in the computer-mediated context and by assisting public health policymakers and practitioners in developing effective strategies to promote social support exchange for patients with chronic and complex diseases (CCD) like IBS through computer-mediated technologies.

### **Theoretical Background**

Social support is a collection of “information leading the subject to believe that he is cared for and loved, esteemed and a member of a network of mutual obligations” (Cobb, 1976, p. 300). Prior literature has repeatedly identified the benefits of social support in protecting individuals in the event of stressful situations, physical (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2002; Uchino, 2004) or mental (Cramer, Henderson, & Scott, 1996; Kawachi & Berkman, 2001).

Within the interdisciplinary scholarships on social support, two perspectives emerged as dominant conceptualizations of social support, representing two different approaches to understanding the impact of social capital on health. Sociologists approach social support from the perspective of social integration (Cohen & Janicki-Deverts, 2009; Uchino, 2004) and argue that social support is beneficial regardless of contexts (stressful or non-stressful events) (Cohen & Wills, 1985). Such a line of inquiry claims an overall positive effect of social support independent of the presence of stress. It is, therefore, called the “main-effect” model of social support (Cohen, 1988). The “stress-buffering” model, on the other hand, approaches social support from a psychological perspective (Brock & Lawrence, 2010), claiming that stress occurs only when one appraises a situation as challenging and demanding (Lazarus, 1966; Lazarus & Launier, 1978). The underlying mechanisms explaining the impact of social support on health is through either appraisal or reappraisal of the potential stressful events (Cohen, 1988).

Regardless of which models, both focus on the benefits of receiving

social support. Neither of these two models explores the other side of the proverbial coin – the antecedents of social support provision. Such knowledge regarding what motivates individuals to offer social support is particularly valuable for patients with CCD like IBS, who are heavily relying on social support for improving their quality of life on a regular basis.

### Technological Affordances and Social Support Provision

One major distinction between online and offline social support is the embodiment of support provision. While social support in face-to-face situations ranges from verbal comforts, to physical expressions (e.g., hug), to tangible support such as shelter and money, social support in online health communities is mostly exchanged in the form of content contribution (Hanasono & Yang, 2016). That is, individuals offer their support to IBS patients through content they put online, including comforting words, suggestions, information regarding new IBS treatments, etc.

Sundar and Limperos (2013) argue that new computer-mediated technologies can provide an array of affordances that drive attitude and behavior changes (Sundar, Oh, Kang, & Sreenivasan, 2013). Online IBS forums are more likely to promote online support providing behaviors through features that enhance users' self-efficacy, sense of community, reciprocity, and emotional expressions (Yang, Zhong, Kumar, Chow, & Ouyang, in press).

### Agency Enhancement

Agency enhancement is a technological affordance that allows users to freely express themselves and serve as the source of online content (Sundar & Limperos, 2013). Agency enhancement works as an impetus for boosting individual self-efficacy because it is essentially egocentric (Sundar, 2008a). Users nowadays have increasingly utilized online communicative technologies for self-expression to assert and communicate their identities through various new media features such as customization (Sundar, 2008b; Sundar & Marathe, 2010).

The degree to which an online community system can help its users strengthen the notion of "self" has been found a powerful driver for their contributions to online communities (Rheingold, 2000). Ciffolilli (2003) found that individuals contributing content to Wikipedia were partially driven by self-identity management because the amount of content contributed was indicative of one's online reputation. Along the same line, Wasko and Faraj (2005) identified reputation as one significant positive predictor for both the sheer volume of content contributed and the quality of content contributed to a national

profession online forum. Similarly, Forte and Bruckman (2006) conducted a field experiment and found that students were more active in editing Wiki pages if they perceived the presence of online audience (also see Lampe, Obar, Ozkaya, Zube, & Velasquez, 2012). Therefore, by contributing content online, students were presenting themselves via serving as the sources of online content.

Joyce and Kraut (2006) surveyed six online newsgroups and supportive groups, and they suggested that individuals who had already presented themselves as active posters were more likely to repeat posting and replying in order to maintain such a “self”. The impact of self-agency on online contribution received further empirical support from Shek and Sla (2008) based on interviews with Amazon customers. The majority of the interviewees pointed out managing one’s identity (e.g., ranked as a Top 100 reviewer) as one of the most important reasons why they would contribute product reviews on Amazon.

A growing number of interface features can promote online contribution by helping users establish and broadcast their identities online. For example, one often-researched feature is the reputation/value cue (Resnick & Zeckhauser, 2002). Rashid et al. (2006) introduced the interface cue of smiling faces (indicative of the value of ones’ recommendations to others) on an online movie recommendation community (MovieLens). Results indicated that individuals were more motivated to make movie recommendations when shown such explicit indicators of one’s reputation. By allowing users to “have their say,” “send their thoughts to many,” and “to broadcast to others” (Sundar & Limperos, 2013, p. 518), the affordance of agency enhancement can presumably encourage individuals to contribute content and to provide social support to others on IBS forums, for it boosts users’ self-efficacy by allowing users to serve as the source of the content.

### Community Building

Community building refers to the affordance enabling users to connect with like-minded others and to reciprocate with others in a community. That is, the degree to which the medium effectively conveys others’ receptions of and reactions to ones’ postings (Stavrositu & Sundar, 2012). Community building includes features that allow users to connect to others, expand their social networks, be part of a community, and to build social capital with each other in online communities (Sundar & Limperos, 2013). Through providing relevant features (e.g., comments, collaboration, discussion), the affordance of community building of a medium can trigger users’ sense of community and allow for reciprocity online.

For example, Wang and colleagues (2016) found that community building was positively related to users' commenting to others' posts on Pinterest. Furthermore, the presence of "collaboration" and "discussion" pages on Wikipedia fostered the sense of community among Wikipedians, which then encouraged the contribution of content (Kuznetsov, 2006). The sense of community can also be cued by the number of comments shown on an online interface. Stavrositu and Sundar (2012) found that the number of comments a blog entry received activated a strong sense of community of bloggers, which encouraged them to keep blogging.

In an online health forum, the sense of community can be directly triggered by the amount of social support one receives, which stimulates people to provide social support to those who they can relate to. Receiving social support from others serves as a powerful signal to individuals that there is a cohesive community of people with shared experiences and care for each other, thereby increasing their sense of community. This could explain the finding of Jou and Fukada (2002) study regarding a strong correlation between the support received and support provided among Japanese college students. Kim and Sundar (2011) manipulated the number of times a given discussion thread was shared and found that higher numbers significantly enhanced users' attitude toward posting and increased their willingness to post online for others in the community.

### Browsing

Browsing is the degree to which users could navigate through a medium to search for information as desired (Sundar & Limperos, 2013). With the rapid technological evolution, a plethora of new media has been invented with advanced features such as virtual reality (VR) products and the Internet of Things (IoT) – that is, the Internet serves "as a cloud therein everyday objects can interact with each other and automatically react to the surrounding environment without continuous human interventions" (Yang, 2016, p. 2). That said, the basic expectation of communicative technologies across the board is to aid users to browse through a medium at their free will (Sundar & Limperos, 2013). As Sundar (2008b) argued, a technology interface can activate users' "browsing heuristic" when it is full of links to encourage users to check out information online.

Being able to browse freely is of particular importance to online health forums as it facilitates users' information seeking, thereby serving as a necessary prerequisite for them to be exposed to emotional support-seeking messages. Previous research has revealed the power of emotion expression in driving support provision. In examining the content that went viral online, scholars

found individuals were significantly more likely to take actions to recommend and to resend an article when the encountered article evoked highly arousing emotions such as satisfaction, awe, and anger (Berger & Milkman, 2013). In support seeking contexts, researchers found that the extent to which “a person directly verbalizes personal feelings or needs for support” (Tichon & Shapiro, 2003, p. 162) worked as an effective support-seeking strategy for eliciting social support (Barnes & Duck, 1994).

It is, therefore, expected that those who encounter emotional support-seeking messages are more likely to provide their support in response. Such exposure, nevertheless, is contingent upon the extent to which one could freely browse through an online health community. That is, the power of emotional support-seeking messages in driving social support provision is contingent upon the extent to which users could browse through various support-seeking messages on a forum and have the opportunity to encounter those messages that are particularly emotional. Therefore, the extent to which an online health community could provide users the browsing affordance online serves as a positive predictor for social support provision online as well.

#### [Altruism and Social Support Provision](#)

Besides the technological predictors, a prominent personal trait that needs to be taken into consideration when it comes to social support provision is altruism, which is one’s selfless belief in the welfare of others at one’s own cost (Trivers, 1971).

According to a functionalistic view, Snyder and Cantor (1998) suggested that individuals took actions and performed certain behaviors in order to serve four major functions, one of which is altruism. Altruism has been repeatedly found as a significant predictor especially for helping behaviors (see Kahana, Bhatta, Lovegreen, Kahana, & Midlarsky, 2013; Harman, 2015). Driven by altruism, people could contribute content online simply as a favor for the public good without any tangible rewards in return (Lee, & Lee, 2010; Ma & Chan, 2014).

A rich volume of research has suggested that altruism significantly promoted helping behaviors as a result of individuals viewing themselves and others as “one” (Chennamaneni, Teng, & Raja, 2012; Jeon, Kim, & Koh, 2011; Hung, Lai, & Chang, 2011). In the context of online content contribution, Nov (2007) interviewed individuals who contributed content to Wikipedia and found altruism as one of the most mentioned motivations by interviewees. Similarly, Wasko and Faraj (2000) also found altruism as one of the important

motivations for interactions among members of online groups. The role of altruism in driving online content contribution has also been confirmed in Subramani and Peddibhotla's (2003) study of motivations for writing online product reviews.

Therefore, it is important to control for the individual difference of altruism when examining how the aforementioned technological affordances could promote social support provision for IBS patients online. Therefore, based on the literature reviewed regarding the roles community building, sense of community, reciprocity, agency enhancement, self-efficacy, browsing, and exposure to emotional support-seeking messages discussed above, we raise the following research hypotheses:

**H1.** Controlling for altruism, agency enhancement can lead to self-efficacy, which ultimately encourages social support provision online.

**H2.** Controlling for altruism, community building can lead to the sense of community, which ultimately encourages social support provision online.

**H3.** Controlling for altruism, community building can lead to reciprocity, which ultimately encourages social support provision online.

**H4.** Controlling for altruism, browsing can lead to exposure to emotional support-seeking messages, which ultimately encourages social support provision online.

## **Methods**

### **Procedures and Participants**

This study conducted an online survey ( $N = 281$ ) of users of online IBS forums. Google search was used with the keyword "Irritable Bowel Syndrome" or "IBS" to identify all relevant IBS discussion forums. As a result, we identified [ibsgroup.org](http://ibsgroup.org), [forums.webmd.com](http://forums.webmd.com), [healingwell.com](http://healingwell.com), [patientslikeme.com](http://patientslikeme.com), [helpforibs.com](http://helpforibs.com), [theibsnetwork.org](http://theibsnetwork.org), [medhelp.org](http://medhelp.org) as primary online forums that are actively used by IBS patients. With the IRB approval and the permission of permissions of forum moderators or administrators, we posted the recruiting message once on these seven sites with a Qualtrics link embedded in January 2017 – March 2017. Users interested in participating in the online survey were invited to fill out a Qualtrics questionnaire voluntarily. They could click on the link and fill out the questionnaire online.

Participants were first asked to list one online IBS forum they used



the most on a regular basis and to think about the forum while answering the questionnaire. The online forums listed by the 278 participants mainly included [www.ibsgroup.org](http://www.ibsgroup.org) ( $N = 148$ ), [patient.info](http://patient.info) ( $N = 25$ ), [Reddit](http://Reddit) ( $N = 22$ ), [www.healthboards.com](http://www.healthboards.com) ( $N = 11$ ), [forums.webmd.com](http://forums.webmd.com) ( $N = 4$ ), [Facebook](http://Facebook) ( $N = 7$ ), [healingdigestivedisorders.org](http://healingdigestivedisorders.org) ( $N = 3$ ), [www.healingwell.com](http://www.healingwell.com) ( $N = 3$ ), [Google](http://Google) ( $N = 3$ ), [www.medhelp.org](http://www.medhelp.org) ( $N = 3$ ), [www.helpforibs.com](http://www.helpforibs.com) ( $N = 2$ ), and others ( $N$ s all equal to 1) - [www.dailystrength.org](http://www.dailystrength.org), [www.patientslikeme.com](http://www.patientslikeme.com), [www.theibsnetwork.org](http://www.theibsnetwork.org), [exchanges.webmd.com](http://exchanges.webmd.com), [www.stomachhelp.com](http://www.stomachhelp.com), [www.topix.com](http://www.topix.com), [www.medhelp.org](http://www.medhelp.org), and so on. Then they were asked to answer a few questions related to their use of the IBS forum online. At the end of the survey, they were asked several demographic questions including gender, age, and race/ethnicity.

The sample included 133 females (47.8%), with the average age of 32.16 ( $SD = 8.84$ ,  $N = 277$ ). Of the 278 participants who responded, 218 (78.4%) self-identified as White, 18 (6.5%) as Black or African American, 17 (6.1%) as Asian, 7 (2.5%) as American Indian or Alaska Native, 1 (0.4%) as Native Hawaiian or Pacific Islander, and 15 (5.4%) self-identified as other races/ethnicities.

### Independent Variables

#### Agency Enhancement

Agency enhancement was measured by four items adapted from Sundar and Limperos (2013). Participants were asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items “The IBS forum allows me to have my say”, “The IBS forum allows me to assert my identity”, “The IBS forum allows me to send my thoughts to many”, and “The IBS forum gives me the power to broadcast to my followers” (Cronbach’s  $\alpha = .75$ ,  $M = 4.99$ ,  $SD = 1.23$ ). In the original item statement, the technology was broadly referred to as “it” (for example, “it allows me to have my say”). We replaced the general term with “the IBS forum” to suit the current research context (for example, “The IBS forum allows me to have my say”).

#### Community Building

Four items adapted from Sundar and Limperos (2013) were used to measure community building. Participants were asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items “I can connect to others on the IBS forum”, “The IBS forum allows me to expand my social network”, “The IBS forum makes me realize that I am part of a community”, and “The IBS forum allows me to build social capital” (Cronbach’s  $\alpha = .72$ ,  $M = 4.87$ ,  $SD = 1.24$ ). Similar to agency enhancement, the general term

“it” in the original statement was replaced by “the IBS forum”.

### Browsing

Using the same adaptation rule as the previous affordances, four items adapted from Sundar and Limperos (2013) were used to measure browsing. Participants were asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items “The IBS forum allows me to obtain a wide variety of information,” “The IBS forum helps me to skim and check out various links,” “The IBS forum allows me to surf for things that I am interested in,” “The IBS forum allows me to browse freely” (Cronbach’s  $\alpha = .80$ ,  $M = 5.14$ ,  $SD = 1.22$ ).

### Mediating Variables

#### Self-efficacy

Self-efficacy was measured by adapting seven items from Nonaka, Toyama, and Konno (2002) and Compeau and Higgins (1995). The original scale was developed specifically for measuring self-efficacy of contributing and sharing knowledge in online communities. On a Likert-type scale of 1 = “not confident at all” and 7 = “very confident”, participants were asked to respond questions such as “To reply to others posts on the IBS forum, how confident are you in providing your ideas and perspectives to others through participating in discussions?” and “To reply to others posts on the IBS forum, how confident are you in providing your experiences, insights or expertise by engaging in dialogue with others?” (Cronbach’s  $\alpha = .90$ ,  $M = 4.86$ ,  $SD = 1.31$ ). The original scale asked several aspects of participants’ confidence as to reply to others’ posts “in the online community”. We replaced the term with “the IBS forum” to suit the specific research topic of the current study.

#### Sense of Community

Twenty-four items from Chavis, Lee, and Acosta (2008) were adapted to the measure sense of community. Participants were asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items such as “When I have a problem, I can talk about it with members of the IBS forum”, “People on the IBS forum have similar needs, priorities, and goals”, and “I can trust people on the IBS forum” (Cronbach’s  $\alpha = .94$ ,  $M = 4.54$ ,  $SD = 1.08$ ). We replaced “the community” in each item of the original scale (for example, “I can trust people in the community”) with “the IBS forum” (for example, “I can trust people on the IBS forum”).

#### Support Reciprocity

Support reciprocity was measured by eight items adapted from Pope, Miller, Wolfer, Mann, & McKeown (2013). Respondents were

asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on four items that measured the extent to which they have supported others such as “Help them get through a difficult time emotionally,” “Do something enjoyable with them,” “Share your own experiences and knowledge,” and “Provide spiritual support (i.e., pray for them)” on the IBS forum. They were also asked to rate on four items that measured how much others they have supported on the forum would support them in return such as “Help you get through a difficult time emotionally,” “Do something enjoyable with you,” “Share their own experiences and knowledge,” and “Provide spiritual support (i.e., pray for you)” on the IBS forum (Cronbach’s  $\alpha = .87$ ,  $M = 4.73$ ,  $SD = 1.30$ ). The original scale was developed for measuring community-based support reciprocity. Participants were asked to rate each item based on a broader term “community.” We replaced the word with “the IBS forum” to suit this current research (e.g., change “How likely would you be there for one or more members of your community group...” to “How likely would you be there for one or more members of the IBS forum”).

#### Exposure to Message Emotions

Exposure to message emotions was measured by three items adapted from Kring, Smith, & Neale (1994). Respondents were asked to rate their responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items “I reply to others’ posts to provide my support when they are very emotionally expressive in their posts on the IBS forum,” “I reply to others’ posts to provide my support when I can ‘read’ others emotions in their posts on the IBS forum,” and “I reply to others’ posts to provide my support when they display their emotions in their posts on the IBS forum” (Cronbach’s  $\alpha = .86$ ,  $M = 4.73$ ,  $SD = 1.44$ ). The original scale was developed generically without any specific context (for example, I reply to others’ posts to provide my support when I can “read” others’ emotions). We, therefore, modified the context as “the IBS forum” (e.g., I reply to others’ posts to provide my support when I can “read” others’ emotions in their posts on the IBS forum).

#### Dependent Variable

##### Social Support Provision

Social support provision was measured by asking the respondents how frequently they replied to others on the IBS forum they used the most (1 = “never” and 7 = “always”).

#### Control Variable

##### Altruism

Altruism was measured by fourteen items borrowed from Rushton, Chrisjohn, & Fekken (1981). Participants were asked to rate their

responses on a Likert scale of 1 = “strongly disagree” and 7 = “strongly agree” on items such as “I would give directions to someone I did not know”, “I would allow someone I did not know to go in front of me in line”, and “I would offer to help a handicapped or elderly person across the street” (Cronbach’s  $\alpha = .90$ ,  $M = 5.12$ ,  $SD = 1.12$ ).

Plan for Data Analysis

Path analyses with 5,000 bootstrapped samples and 95% bias adjusted confidence intervals were run (Preacher & Hayes, 2008) to examine research H1 through H4, which predicted significant positive relationships among agency enhancement, community building, and browsing and social support provision via self-efficacy, sense of community, exposure to message emotions, respectively, controlling for altruism.

Table 1 reports the correlation matrix of all variables under study. As shown in Table 1, the independent, mediating, control, and dependent variables were significantly correlated with each other. As such, the path analysis was run for each predictor while controlling for the other two predictors plus the control variable for the sake of teasing out each predictor’s contribution to social support provision. For example, the path analysis was run with agency enhancement entered as the independent variable and social support provision as the dependent variable while altruism, browsing, and community building were all controlled for. The same procedure was repeated for each predictor.

Table 1. Correlation matrix of all variables under study

	01	02	03	04	05	06	07	08	09
01 Agency Enhancement	-								
02 Community Building	.76***	-							
03 Browsing	.48***	.47***	-						
04 Self-Efficacy	.65***	.59***	.47***	-					
05 Sense of Community	.66***	.69***	.56***	.70***	-				
06 Reciprocity	.55***	.63***	.39***	.57***	.72***	-			
07 Exposure to Message Emotions	.56***	.55***	.43***	.64***	.68***	.65***	-		
08 Altruism	.40***	.35***	.49***	.40***	.44***	.46***	.43***	-	
09 Social Support Provision	.39***	.41***	.20***	.44***	.54***	.45***	.55***	.17**	-

## Results

As hypothesized by H1 which predicted a significant positive association between agency enhancement and social support provision mediated by self-efficacy, agency enhancement had a significant positive effect on social support provision partially via self-efficacy ( $b = .27$ ,  $SE = .07$ ,  $LLCI = .1560$ ,  $ULCI = .4182$ ). There was a significant direct effect of agency enhancement on social support provision as well ( $b = .26$ ,  $SE = .10$ ,  $LLCI = .0089$ ,  $ULCI = .0668$ ). Along the same line with H2, there was a significant positive association between community building and social support provision, fully mediated by the sense of community ( $b = .38$ ,  $SE = .07$ ,  $LLCI = .2387$ ,  $ULCI = .5397$ ).

However, while H3 predicted that community building would have a significant positive indirect effect on social support provision through reciprocity, results of the path analyses failed to support such prediction ( $b = .12$ ,  $SE = .07$ ,  $LLCI = -.0150$ ,  $ULCI = .2526$ ). Furthermore, as H4 hypothesized, there was a significant positive indirect effect of browsing on social support provision, fully mediated by exposure to message emotions. Furthermore, there was a suppression effect (Conger, 1974; Maassen & Bakker, 2001), such that when the exposure to message emotions was included as the mediator between the relationship of browsing and social support provision, the relationship significantly changed its original direction and valence (from  $r = .20$ ,  $p < .01$  to  $b = -.01$ ,  $p > .05$ ). Such an effect indicated that browsing could not positively predict social support provision, unless users who were browsing through IBS online forums encountered emotional support-seeking messages. Figure 1 reports the statistics associated with the relationships among agency enhancement, community building, and browsing, and social support provision.

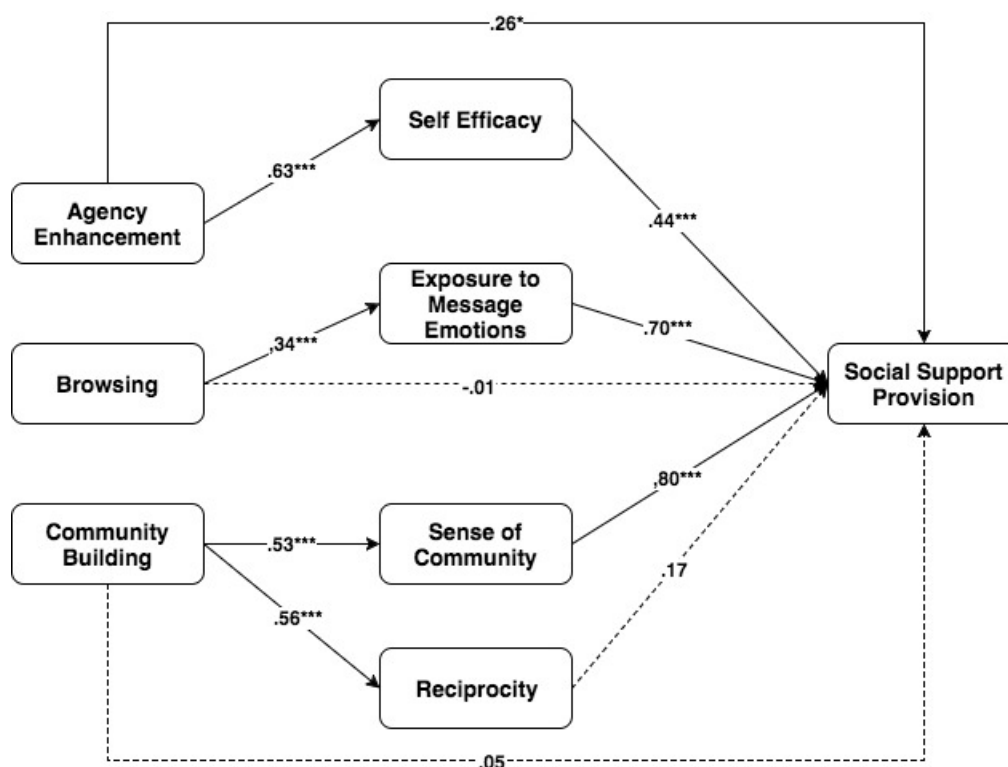


Figure 1. The indirect effects of agency enhancement, community building, and browsing on social support provision via self-efficacy, sense of community, reciprocity, and exposure to message emotions.

Therefore, H1, H2, and H4 were supported. H3 was not supported.

## Discussion

This study takes a technological approach to social support provision and investigates how technological affordances could promote individual social support providing behaviors in online IBS health communities, controlling for the individual personal trait of altruism. Results of this study confirmed previous research regarding the roles of self-efficacy, sense of community, and message emotions in promoting online social support provision for IBS patients.

First, the agency enhancement affordance that allows users to have a voice and to assert their identities in online health communities significantly influences individual support provision because it increases their efficacy to share knowledge and information regarding IBS with peers. In this era of new media, the notion of “self” has been increasingly celebrated by users online (Sundar, 2008a). As prior studies have repeatedly found that lack of confidence and the apprehension of criticism discouraged individuals from actively sharing their knowledge in online communities (Bordia et al., 2006), it is, therefore, crucial for online community systems to facilitate users to establish their identities as “capable helpers” and to boost their confidence in helping others, so that they could be more motivated to provide their support through sharing information.

Furthermore, when users were encouraged to connect with others as a member of an online IBS community and to build their sense of community with others in it, they were significantly more likely to support others. This finding confirmed previous literature regarding the power of the sense of community to drive individuals to contribute to online communities (Antin, 2011; DiFranzo & Graves, 2011; Du et al., 2009; Jian & Jeffres, 2006) and revealed that community building could motivate online social support provision through the sense of community.

On the contrary, although community building afforded by online health community systems could activate support reciprocity among users, such reciprocity, failed to predict individual social support provision. Its non-significant role could be due to the dyadic nature of support reciprocity because it encourages exchanges of social support among pairs of individuals but not among the entire community in general.

This study also provides support to the role of emotional expression in one's support-seeking messages in driving social support provision. As suggested by previous studies (Berger & Milkman, 2013), users were much more likely to take actions when they were exposed to emotions such as anger, happiness, and sadness in messages. When users could freely browse information on IBS online health forums and encounter emotional support-seeking messages from others, they were significantly more likely to provide their support in return.

This research advances the existing literature on social support in the computer-mediated context. As previous social support literature has exclusively focused on the outcomes of social support reception, this study explores the other side of the story – the antecedents of social support provision driven by technological affordances in online health communities. Results of this study fill in the theoretical gap on how technological affordances could work together in promoting online social support provision for patients with CCD. While prior research has mostly examined how different message features could influence the extent to which one's support can comfort support seekers, this research expands the current literature by exploring the role of message emotions in helping individuals get more social support.

Several critical practical implications stem from the findings of this research as well. To begin with, online support communities should pay more attention to enhance users' sense of community through the affordance of community building, and self-efficacy through

agency enhancement affordance. For example, some functions such as email, notifications, or other interface cues that remind users how much they have helped and been helped by others in the community could strengthen their self-efficacy and sense of community. Given the value of emotional expressions during support seeking for the purpose of obtaining more help, online support communities should consider improving their systems to fully facilitate free browsing of the information posted. More importantly, the results of this research suggest that only when individuals are exposed to emotional support-seeking messages will browsing positively impact their social support providing behaviors. With the help of language processing and/or analytical techniques, online health communities could increase individual exposure to message emotions by helping users navigate to those messages that are explicit about support-seekers' feelings of their own experiences of CCD.

### **Limitations and Future Directions**

This research is not without limitations. One limitation is that although this research takes a technological approach to examine how technology can motivate online social support provision for patients with CCD. The predictors investigated under study are not exhaustive. Future studies could expand upon this current research and explore more antecedents of social support provision so that more strategies could be developed to increase social support for patients with CCD using online communicative technologies. Furthermore, while this research controls for the personal trait of altruism, future research could take one step further and investigate how findings could be moderated by other individual differences (e.g., age, gender, etc.).

While the nature of survey research provides limited insight as to the exact effects of particular features on social support provision, follow-up experimental research could draw on this current findings and test how certain features on a specific new media platform could help increase social support provision for underserved populations. As various social support groups continue to grow online, it is crucial to continue exploring the underlying mechanisms through which individuals can be motivated to support each other. In doing so, health care providers and social support organizations could develop better effective strategies to promote social support behaviors for those who are living with CCD using online communicative technologies.



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**To cite this article:**

Yang, F. (2020). Motivating online social support provision to patients with complex chronic diseases: A technological-affordance approach. *Journal of Communication Technology*, 3(1), 30-52. DOI: 10.51548/joctec-2020-003