EFFECTS OF ONLINE BUDDIES AND BANDWAGON CUES
ON USER PARTICIPATION IN AN ONLINE HEALTH COMMUNITY

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ABSTRACT

Individuals who join online communities generally do so to obtain information and support than to offer it to other users, thus raising concerns of under-contribution. Social impact theory (SIT) suggests that this could be due to lack of perceived social responsibility—also referred to as social loafing (Latané, 1981). The core argument of SIT is that individuals are unlikely to offer someone help unless they have received a specific request for such help. This dissertation operationalizes the notion of a specific request in the form of an online buddy and investigates whether it encourages participation among users in a health community website. In addition, it investigates whether collective community feedback, in the form of bandwagon cues, persuades users to participate, as predicted by social facilitation theory (Zajonc, 1965) and the MAIN model (Sundar, 2008a).

The study employed a 2 (online buddy: absence vs. presence) by 2 (bandwagon cues: weak vs. strong) between-participants factorial design experiment to test the effects of two main variables on participants’ psychological outcomes, including perceived responsibility, social presence, perceived evaluation, sense of community, perceived helpfulness, and psychological reactance, as well as their posting attitudes, posting intentions, and website attitudes, across two sessions that were two to three days apart. The study constructed a prototype of an online health community website for the experiment.

The major findings of the study are that 1) assigning specific online buddies to users in a community forum may lead to negative psychological and behavioral consequences; 2) the online buddy cue interacts with bandwagon cues to activate different cognitive processes, leading to differential interpretation of the meanings of those bandwagon cues — either as compliments (in the presence of online buddy) or as unreliable feedback (in the absence of online buddy) — and consequent psychological outcomes; and 3) in the absence of strong community feedback, the
online buddy reduces users’ sense of community, thus leading to negative attitudinal and behavioral reactions among participants.

These findings imply that the social responsibility that users typically associate with online communities is undermined by the personal responsibility involved in helping specific individuals in those communities. Furthermore, the existence of online buddies makes users interpret community feedback in different ways. More specifically, when users have online buddies, positive community feedback signaled by strong bandwagon cues creates more pleasant psychological states than negative community feedback signaled by weak bandwagon cues. However, in the absence of online buddies, the strong bandwagon cues generate a greater level of accuracy motivation to verify the veracity of community feedback. This dissertation discusses these and other related theoretical implications as well as practical implications for online community designers.
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Introduction

Emily, a 20-year-old college student, has been concerned about her diet recently. Although she does not have any serious issues with her eating, she realized that she is consuming a lot of carbohydrates at every meal. Of course, Emily has already made a variety of attempts to reduce her carbohydrate intake, but thus far, she has not made much progress. She eventually figured out the reason for her failure. Her close friends in her dorm are all carb lovers, and whoever she asked for diet advice also tends to eat a lot of carbs. Therefore, Emily decided to go online to seek help. One of Emily’s high school friends recommended an online community, healthboards.com, which has more than 800,000 registered users. After joining the community, Emily explored specific message boards related to her needs, such as “diet and nutrition” and “diet and fitness.” After mining and luckily obtaining the information she needed to improve her dietary plans, Emily noticed that a relatively small number of frequent users seemed to generate most of the content in the community. In fact, she realized that she never joined conversations or shared her own experiences with other community members. She felt the community would thrive with rich information and support without her contributions. Moreover, no one seemed to pay attention to her presence in the community anyway. What made Emily reluctant to actively participate in the community despite personally benefiting from others’ contributions to the community? Would she become willing to help other users if the community stressed her social responsibility?

In general, more people read, rather than contribute to, online communities (Fox & Jones, 2009; Preece, Nonnecke, & Andrews, 2004). Scholars recognize this lurking phenomenon and have studied this problem’s dimensions (Nonnecke, Preece, & Andrews, 2004; Preece et al.,
While some have focused on characteristics of online community, such as its size (e.g., Shiue, Chiu, & Chang, 2010), others have explored psychological factors that explain the existence of under contribution (e.g., Bishop, 2007), including the lack of motivation (e.g., Preece et al., 2004). However, neither research direction has provided effective solutions to eliminate lurking and increase contributions.

As briefly illustrated in the user scenario above, the previous literature points to common reasons for lurking: lack of social responsibility for contribution and users’ apprehension about how other users in online communities would react to their postings. As Preece and colleagues (Nonnecke et al., 2004; Preece et al., 2004) have found, people do not want to participate in online communities because they do not have any reason to do so. Furthermore, people are often reluctant to contribute to communities because they are not sure how others will react to their participation.

Among the potential solutions for this problem is an online buddy system that embraces these two major reasons for under contribution (Du, 2005). In conceptualizing the buddy, it becomes obvious that the buddy is simply one instantiation of the larger tendency among online users to orient themselves toward other users. A more widely known instantiation is collaborative filtering, which results in so-called “bandwagon cues” in a number of major online domains, particularly e-commerce and increasingly in e-health. However, even though both bandwagon cues and the buddy cues signal different forms of invitations for online participation among strangers, there are some important differences. This dissertation explicates those differences in the following pages, proposes hypotheses for their direct and combined effects on user contributions to an online health bulletin board, and performs an experimental investigation to empirically test these hypotheses.

The primary purpose of this dissertation is to introduce an innovative interface design feature in the form of an online buddy system to promote user interactions and contributions in
online communities. The following chapters will set the context for this work by examining previous studies based on social psychology theories for information sharing in online communities. The literature review aims at constructing a strong theoretical basis for this new online buddy design. Then, the methodology designed to test the effects of the online buddy system in an online health community are described. Finally, the results of this study and a discussion of the findings’ implications for theory are provided.

Chapter 1

Literature Review

This chapter will begin with a description of online communities and the structural aspects associated with such communities that contribute to lurking behavior and the consequent problem of under contribution. The chapter will then discuss key theoretical frameworks that converge upon a solution in the form of an online buddy system, a novel design feature that can address the under-contribution problem. The buddy concept will be explicated next, and theoretical arguments will be forwarded for making the buddy system function effectively. In particular, community feedback by way of bandwagon cues will be proposed as a positive reinforcement to the buddy system. In the end, the chapter will also consider the negative effects of both the buddy system and bandwagon cues, which might undermine their ability to solve the under-contribution problem.

The Nature of Online Communities

Online communities are spaces where people who have common interests gather together and share information and support without physical contact or geographical limitations (Kollock
& Smith, 1999; Ridings et al., 2002). Examining the variability of online communities in terms of their birth, sustainability, and death is important in understanding their functions (Faraj, Jarvenpaa, & Majchrzak, 2011). Basically, online communities are “fluid objects” (Faraj et al., 2011, p. 1226) through which information emerges and is transmitted and modified. In this sense, online communities are like other communities in that people visit them, do their business—generally obtaining necessary information and support—and leave with or without having the intention to revisit. Therefore, one of the critical factors in online communities is having sufficient resources for people to create and/or consume. Of course, the resources exchanged in online communities, as a form of public goods, are free (Kollock, 1999).

This resource-based point of view calls for other subsequent factors with regard to the structure and function of online communities. For instance, users do not have particular obligations to create public goods even if they do have the need to consume it. Few individuals are willing to pay more than what they can gain from a pool of public goods. As a result, no one is likely to participate in sharing information if s/he knows others did not put much effort into the sharing process. Such a user perception, in turn, leads to an “undersupply of discretionary information” (Connolly & Thorn, 1990, p. 221; Fox & Jones, 2009; Mo & Coulson, 2010), which often happens when public goods are stored. In order to prevent information undersupply, online communities focus on expanding community size by recruiting more members. Thus, the larger the community is, the more content it will have. While the problems caused by information overload, such as credibility issues and lack of diverse opinions (Sproull & Faraj, 1997), can be solved by moderators, which are common in online communities (e.g., Jones et al., 2004), the decreased contributions among users as the community size grows is rather complex. Even when the community size grows, thereby increasing the number of users, why do many online communities face the under-contribution issue?
Social Loafing Behavior and Social Impact Theory

When people are asked whether they are willing to help a stranger or put forth their full energy for a collaborative task, most are reluctant to take on actions requiring a high level of responsibility. Latané (1981) proposed social impact theory (SIT) by synthesizing numerous studies testing the dynamics of individual behaviors depending on strength, distance, and number of interactions with others. One of the propositions that Latané (1981) introduced to illustrate SIT is the dilution of social responsibility. According to SIT, the mere existence of others can induce the “bystander effect” such that if someone needs help and an individual realizes it, that person may feel that someone should help but does not necessarily take action because there are others around (Latané & Dalrey, 1970). This social loafing tendency in a group is undoubtedly predictable (Latané, 1981) and has been observed in numerous laboratory and field settings (Latané & Nida, 1981). For instance, when people received personal requests for help from someone (i.e., a victim of a theft) at a public library but noticed there were others who could also possibly help, they exerted less perceived responsibility and more negligence than when they were alone. However, a direct request for the help from a victim may also capture individuals’ immediate attention to the incident, thereby curtailing the degree of the bystander effect (Shaffter, Rogel, & Hendrick, 1975). Thus, unless evident responsibility is assigned to an individual specifically, people in a group feel less responsible for a given task.

Group size also matters in social responsibility dilution. Social psychologists have tested the effect of group size on one’s willingness to take action. For instance, two experiments replicating Ringelmann’s rope-pulling task examined the relationship between group size and collective effort (Ingham, 1974). As predicted, participants lost their motivation to pull the rope as the group size increased. Latané, Williams, and Harkins (1979) also replicated the study employing shouting and clapping tasks among college students. Even with a simple psychological
manipulation of others’ presence (i.e., informing participants to shout or clap together with other people who actually did not exist at any other location), the participants became less devoted to the experiment task as the group size increased. This social loafing tendency was also observed while people collaborated on a cognitive task—evaluating a poem as editorial board members (Petty, Harkins, Williams, & Latané, 1977). With this research in mind, could this social loafing tendency also happen during online social interactions?

**Negative correlation between community size and user contribution rates online**

It is likely that social interactions in different-sized online communities also invoke social loafing among users. As mentioned earlier, large communities can produce greater amounts of resources than small communities. This resource availability is, in fact, one of the most immediate criteria that users employ to make membership decisions (Arguello et al., 2006; Whittaker, 1996). However, an online community’s larger size can hurt not only diversity but also resource cohesiveness when only a few consistent contributors generate those resources (Sproull & Faraj, 1997). Considering that such information diversity and cohesiveness is critical to users’ perceptions of the information’s quality, social loafing can be detrimental to sustaining a community’s success (Shiue, Chiu, & Chang, 2010).

Yechiam and Barron (2003) investigated possible outcomes from the different levels of social responsibility in large groups. First, they found that people might not be very responsive to a task (i.e., responding to a survey) if they perceive that it was assigned to other people besides themselves. In this context, individuals may feel that their effort would not be very helpful because other people’s help would count more than theirs (Cialdini, 1993; Latane & Darley, 1968). Second, they found that people might be willing to help someone else if they perceive there to be strong community ties from being on the same recipient list (Staples, 2000). Also,
sending a request via a listserv might be less invasive than sending it directly to individual accounts. These findings supported the first prediction in that people accessed surveys more when they were sent via individual emails than when they were sent to a large listserv including 20 discussion groups with up to 800 subscribers. Therefore, Yechiam and Barron (2003) concluded that people tend to ignore “help requests” sent to larger groups of people that also include themselves.

This finding is consistent with the dilution effect posited by SIT such that increases in the number of users in an online community will attenuate users’ willingness to become a source of information (Karau & Williams, 1995; Latané, 1981). This dilution effect can explain the onset of lurking behaviors online. Chidambaram and Tung (2005) found that small groups induced greater member contributions than bigger groups in collaborative decision-making tasks. Voelpel, Eckhoff, and Förster (2008) also found a negative relationship between the size of the community group and participation rates. By analyzing replies to a question that researchers posted in 333 online Yahoo.com communities (i.e., “I’m so happy that I found this group. However, I have one question: Does anyone know how I can upload more than one picture at once. Thanks, Sam.” [p. 280]), they found that the larger the community (100–250 vs. 0–99 members), the fewer the replies. The quality of the replies was also better in smaller groups than larger groups.

**Online buddy as a solution**

The under-contribution problem seems inevitable in large-sized communities. In particular, the problem emerges because users tend to neglect the social responsibility assigned to them (Karau & Williams, 1995). Therefore, in the interaction process among users, assigning some level of responsibility to users could generate their interest in communicating with other users within a large online community. If this is the case, what would be an ideal way for online
community websites to increase users’ social responsibility and motivate them to become active and help others in the community? What could such sites do to keep users interested and comfortable, especially when they are sent requests to help anonymous users?

Du (2005) suggested the idea of an “online buddy system” as a method to eliminate online lurking. This de-lurking strategy goes hand in hand with solutions to alleviate users’ lack of attachment to a group. What if users realize that their buddy will wait for them until they come back and respond personally to the buddy? Will that motivate them to participate? The following section briefly explores the buddy concept to specify the roles of online buddies and their connection to the core theoretical framework pertaining to social responsibility dilution in the context of online information sharing.

What is a buddy?

The general definitions of a buddy are a close friend or person who one knows and shares activities. A buddy can also be a person with whom one is not acquainted. However, the formal definitions of the term buddy stress a certain level of emotional affection between two individuals who share interactions (Merriam-Webster Dictionary, 2011).

Previous literature has used the term buddy in a variety of ways. Some researchers define a buddy as a peer who can teach and guide another peer. This use of the term emphasizes the effectiveness of “learning through teaching” by accelerating “cognitive challenges” during interactions (Topping, 2005, p. 632). Therefore, this type of buddy plays the role of a mentor in certain interactions. For instance, Flannery, Levitre, Rego, and Walker (2011) suggested that senior staff in a psychiatric hospital can serve as this type of mentor buddy as they teach skills and provide information when junior staff members are assaulted by psychiatric patients (p. 19). Other researchers have found mentor buddies in the form of experienced individuals who help
novices adjust in a program or course (Treston, 1999) and as preceptors who teach and guide
dietetic strategies (Ortman, Mann, & Arsenault, 2010; Wilson, 2002). Overall, mentor buddies
“are competent, proficient and skilled as well as conducive to others, easy to be contacted, jovial,
responsible and sincere” (Abdullah et al., 2010, p. 123). Therefore, they can lead other
individuals in need. For instance, a guiding teacher can be a mentor buddy of another teacher by
providing resources and support and by challenging colleagues (Abdullah et al., 2010).
Researchers have also found that older people (i.e., undergraduates) can be successful mentor
buddies for young children who engage in bullying behavior (O’Donnell & Fo, 1976) or for
bullied youth (4th–5th graders) (Elledge et al., 2010).

Another type of buddy is the helper buddy who “transmit[s] information and help[s] drill
special skills” (Damon, 1984, p. 331) rather than sharing intellectual resources or emotional
support at a superior level like a mentor buddy. For instance, study (helper) buddy partners are
peers who can provide feedback on each other’s work. In this case, the peers exchange resources
and have equivalent learning capabilities (Thomson, 2010, p. 689). Helper buddy partners can be
peers who “facilitate intellectual discovery and acquisition of basic knowledge” (Damon, 1984, p.
331) as well, or they can be people from a group who solve problems by sharing ideas (Kukulska-
Hulme & Pettit, 2008, p. 41). Researchers have also identified children who help disabled
children by initiating social interactions and participating in outdoor activities together as helper
buddies (Armstrong, Rosenbaum, & King, 1987). In the military context, soldiers (called “buddy
ones”) often help returning soldiers who need to adjust to a different environment. These “buddy
ones” are of similar rank but are informally viewed as unit leaders (Greden et al., 2010).

Another definition of the buddy is as a supporter. The supporter buddy can provide
functional support, including both emotional and instrumental support, within a support network,
such as for smoking cessation (Bauld et al., 2009; May & West, 2000). Individuals who share the
same problem (i.e., smoking) encourage each other to achieve their goals (i.e., remaining
abstinent) (Cobb, Graham, & Abrams, 2010; May et al., 2006). The concept of the supporter buddy has been used in networks of social support for physical activity (Bopp et al., 2007; Jago et al., 2011) and e-therapist education (Elleven & Allen, 2004). Sometimes, supporter buddies do not necessarily provide direct support. They can also motivate other people in the network and community to achieve their goals by exerting their influence on others as a role model of certain behaviors, such as living a healthy lifestyle (Holland et al., 2008).

**Operation of buddies**

Accordingly, buddies can have different roles depending on the interactant’s goals and the buddy’s qualifications to assist the interactant to achieve those goals. In fact, all these buddy types—mentor, helper, and supporter—ultimately aim at motivating interactants to achieve their goals. Goals are certainly diverse across different interaction contexts, such as smoking cessation (e.g., May & West, 2000), physical activity (Bopp et al., 2007; Jago et al., 2011), education (e.g., Thomson, 2010), or any other topic in which people can share interest. As optimal matching theorists argue, the importance of the buddy’s role centers on the interactant’s needs (Curtrona, 1990; Curtrona & Russell, 1990). The core proposition of optimal matching theory (OMT) is that one’s satisfaction is optimal when the social support that s/he receives is compatible to what s/he needs. Here, social support is defined as “an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient” (Shumaker & Brownell, 1986, p. 13). OMT specifies five types of needs that people generally seek to satisfy within community boundaries: emotional needs, social integration or networking, needs for esteem, tangible aids, and information needs (Cutrona, 1990, p. 7).

Such needs can vary depending on the roles of buddies. For instance, the mentor buddy (i.e., peer or senior) in a school requires an interactant who needs both intellectual knowledge and
emotional support (Abdullah et al., 2010). However, the helper buddy in the same school setting (i.e., mostly peers) is only relevant for someone in need of knowledge rather than emotional comfort (Topping, 2005). On the other hand, a support buddy in a physical activity or smoking cessation program provides his/her interactant with mostly emotional support (e.g., continuous encouragement) rather than tangible or information aids. Both the mentor and supporter buddy might share the boundary of satisfying interactants’ needs for social integration or networking because such needs are likely to require emotional bonding.

With regard to buddies’ capability to motivate interactants, the mentor buddy has a high level of cognitive capability based on prior experiences, including knowledge acquired by education, as well as emotional availability to embrace another peer in need. On the other hand, both the helper and supporter buddy may not need such superior qualities; rather, they must possess compatibility in terms of resource availability. Their roles are akin to what Topping (2005) described as “peer learning” or “the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions” (p. 631). This explication speaks to one’s capability to provide resources or support that others need. Although not specified by Topping (2005), the supporter buddy functions similarly to the helper buddy.

In terms of interaction size, the buddy must require at least one other interactant or mate. A single individual cannot be called a buddy without another counterpart. In this sense, the definition of buddy becomes concretized in a special operation called the buddy system. The buddy system refers to an arrangement in which two people help or protect each other (Merriam-Webster Dictionary, 2011). The common one-on-one relationships in smoking intervention programs are a good example of the buddy system. Regardless of their smoking status, intervention program participants support their buddies in their attempt to quit smoking, particularly with psychological support rather than tangible needs (Bauld et al., 2009; May & West, 2000).
Sometimes, the buddy system is not in the form of one-on-one relationships. Rather, it can include a broader relationship among a number of people who have similar goals (Topping, 2005). Like multiple-member buddy systems, Topping (2005) suggested that peer learning could be divided into several sub-dimensions depending on purpose. Collaborative learning is co-working aimed at “structuring positive interdependence” in small groups, not pairs (p. 632). Peer monitoring is a peer learning technique that requires buddies to observe the behaviors of others in a group to determine whether the behaviors are appropriate and effective to achieve the group’s particular goals. Lastly, peer assessment is a technique with which buddies can evaluate products or outcomes of other groups’ learning. One foreseeable obstacle to these peer-learning techniques is an excessive degree of competition among buddies. Therefore, such a multiple-member buddy system might not be as effective as one-on-one relationships.

Buddy system in online communities

In computer-mediated communication, the buddy concept has predominantly been used to refer to an individual’s acquaintances in his/her personal instant messaging (IM) network (Delmonico & Griffin, 2008; Glass & Li, 2010; Kim & Yun, 2008; Nardi, Whittaker, & Brander, 2000; Ndiwalana, 2003). The role of buddies in personal networks cannot be limited to a particular mentoring, helping, or supporting scope because their role is unpredictable. Buddies on a chat list may share the same interests, but most of the time, they are online friends connected through chatting software for various reasons ranging from private to official. Moreover, it might be difficult to find parallels among online IM friends and online buddies proposed for this dissertation in that IM friends are not assigned to a user but are added by the user based on prior relationships.
A few previous studies operationalized the buddy system in online intervention programs. For instance, Guendelman et al. (2002) employed an online agent to play the role of a buddy in an asthma intervention program for third-grade children. During the initial stage of the program, a real nurse sent a set of queries to patients each day via the Internet that they could answer by pressing one of four buttons. Although no specific agent was present while the children interacted with the computer when answering the questions, the children perceived that they were interacting with an agent who gave them questions—either someone over the computer or the computer itself (Sundar & Nass, 2000). During the interaction, the children received immediate feedback on their performance in the form of either praise when they provided the correct answer or encouragement to solve the problem again when they answered incorrectly. All the interaction results were sent to the nurse coordinator who reviewed the information and repeated the process based on the children’s performance in order to improve their knowledge of asthma. As this example demonstrates, in an educational setting, instructors can provide educational information, as well as offer discussion opportunities, to students via a website (Thomas & Penn-Edwards, 2007), which could be perceived as an agent, particularly a helper buddy.

The buddy system explicated thus far primarily pertains to a reciprocal relationship between two individual users in which either of the buddies expects to be responsible for achieving goals. However, the agent operationalized in these two studies (Guendelman et al., 2002; Thomas & Penn-Edwards, 2007) is not tied to the social-responsibility element underlying the problem of lurking. In fact, a buddy in the form of an automated agent is programmed such that the role and function of the buddy is distant from the original concept of fulfilling user responsibilities during interactions because of the absence of reciprocity. In order to faithfully operationalize the concept of online buddy, the system needs two actors for an interaction—a provider buddy and a recipient buddy. For instance, the buddy system in a smoking intervention program matches one participant who is eligible to provide support to another participant who
needs to quit smoking and continue abstaining from it (e.g., May & West, 2000). Therefore, the “provider buddy” helps the “recipient buddy” accomplish his/her goal to quit smoking. Likewise, the interaction between provider and recipient buddies becomes the basis of the buddy system in an online community, which, in order to function effectively, requires appropriate matching of participants’ support needs and ensuring that provider buddies have the capability to fulfill their role.

With this in mind, the current investigation focuses on assigning a provider buddy to a recipient buddy seeking support in a community rather than assigning an agent to random users. It does not investigate both sides of the buddy roles (i.e., the provider and recipient), however, because users should not be treated as people who need help or support to fix their lurking problem. Lurking is not antisocial or detrimental to online communities because lurkers themselves are one of the chief elements that make up the community (Preece & Shneiderman, 2009). Therefore, users do not need their buddies to help them. Instead, they can serve as supporter buddies. In doing so, they automatically overcome their lurking behavior because the very act of lending support to others will require them to contribute to the community.

**Online buddy system and social responsibility**

Given the operationalization of the buddy system based on the one-on-one relationship among users, the assignment process in the buddy system can specifically address the core proposition of SIT (Latané, 1981), particularly by attenuating typical individuals’ loafing behaviors caused by social responsibility dilution in large groups. As Shaffer et al. (1975) observed, because of the significance of a direct request from someone in need (i.e., a help request from the victim of a library theft) on potential support (possibly caused by immediate attention to the request), the assignment process is likely to make the provider buddy
automatically perceive the needs of his/her counterpart—the recipient buddy. This is especially 
true when an individual sends a direct request to the provider buddy in the smallest-sized group 
(i.e., a one-on-one interaction). In small one-on-one groups, it is likely that the provider buddy 
will take appropriate action promptly (Yechiam & Barron, 2003). Thus, allocating social 
responsibility through the online buddy system in a community will persuade users to contribute 
to the community. On the other hand, absence of a buddy assignment will be associated with a 
relatively lower level of perceived responsibility.

H1a: When users are assigned to help another user in an online community, they will 
perceive greater social responsibility than when they are not assigned to a specific user.

H1b: The more social responsibility there is, the greater an individual’s intention to help 
will be and the more he/she will actually perform helping behaviors.

Effects of Evaluations: Interplay of Social Impact Theory and Social Facilitation Theory

Benevolence is human nature. This characteristic, however, becomes prominent as 
interactions with other people increase (Schwartz, 1992). Therefore, in order to promote user 
contributions in online communities, initiating interactions with other users in online 
communities should precede community members’ search for similarity with other members 
(Rashid et al., 2006) or their acceptance of diversity in opinions and experiences (Ludford, 
Cosley, Frankowski, & Terven, 2004). In this sense, the online buddy system will create a natural 
process for interaction initiation.

However, even if the online buddy system itself aims at modifying users’ loafing 
behaviors, it might not be sufficient to encourage lurkers to move forward and repeat such 
interactions. Karau and Williams (1995) pointed out that people become lurkers because they 
think 1) their efforts in a group will not be evaluated properly (i.e., evaluation apprehension) and 
2) their contributions seem trivial or even redundant compared to others’ responses in the group
(i.e., dispensability of effort). The online buddy system may eliminate the latter concern among lurkers because lurkers will perceive that their support is exclusive to their recipient buddy. However, it is necessary to offer provider buddies (i.e., the lurker) visible feedback, or else they may believe their efforts are not evaluated at all. Furthermore, the feeling of marginality that newcomers often perceive can be overcome when other community members provide attention and feedback to those newcomers’ efforts (Schlorshere, 1989). Such psychological marginality is likely to happen to lurkers as well.

In fact, SIT also stresses the significance of feedback on the immediacy gap in peer-to-peer communication settings. When newcomers or lurkers feel isolated from a community (i.e., lack of immediacy with regard to their contribution activities), they become indifferent to community contributions (Karau & Williams, 1995). In other words, when group members see their participation efforts are clearly presented to other members and also receive respectful feedback from other members on their contributions, they contribute more. Therefore, it is important to provide immediate community responses to users’ activity (Chidambaram & Tung, 2005). Similarly, Yechiam and Barron (2003) also suggested that it is critical to emphasize the importance of individuals’ efforts at the public level by awarding positive community feedback and enhancing reputation to promote user contributions.

According to the social facilitation theory (SFT) (Zajonc, 1965), the mere presence of others enhances one’s ability to complete a simple task (Cottrell, Wack, Sekerak, & Rittle, 1968; Harkins, 1986; Latané, Williams, & Harkins, 1979). For instance, Shaffter et al. (1975) observed people’s immediate attention to help requests during a theft when others were present when the victim directly requested help. More specifically, feedback on individuals’ performance reinforces their contributions (Zajonc & Brickman, 1969). Therefore, it is reasonable to predict that when interacting with an online buddy becomes a routine activity for lurkers, they will be more likely to pay attention to feedback and, thus, more willing to continue interacting with their
online buddy. Based on the SFT framework, Rafaeli and Noy (2002) found that the presence of others played a significant role in individuals’ enhanced task performance (i.e., using an online auction) than when no others were present. The positive effect of feedback also appeared among newcomers—potential lurkers—in Usenet newsgroups (Arguello et al., 2006). As such, it is likely that users will have better performance (i.e., contribute more content) when they realize others will read their postings and when they actually see others’ feedback compared to when they do not notice others’ presence in the community.

**Bandwagon cues as community feedback**

Given that feedback from the community is quite critical for eliciting active participation from forum contributors, cues on the interface that communicate the value of their contributions are likely to be quite influential. For instance, when a user posts a comment to a question on a message board, s/he expects other users’ feedback on whether the comment was helpful. Specifically, prevalent forms of community feedback include how many users read a particular comment/posting, how many people participate (i.e., reply) in the thread with the comment/posting, how many people indicate that the comment or thread of related postings is helpful, and how many people share the comment or thread of postings with other users outside the community (Kim & Sundar, 2011). Sundar (2008a) suggests that these community feedback indicators trigger a mental shortcut to evaluate information without effortful cognitive thought processing (Chaiken, 1980, 1987; Petty & Cacioppo, 1986) and, hence, activate a bandwagon heuristic among information users —namely the idea that “if others think that this comment is good, then I should too” (Sundar, 2008a, p. 83). Therefore, these community feedback indicators, called bandwagon cues, signal the content’s high quality and popularity based on community consensus. As such, provider buddies (i.e., lurkers) can perceive a great number of bandwagon
cues if the community positively evaluates their contributions. Accordingly, bandwagon cues can be operationalized as a natural feedback system in online communities.

Therefore, bandwagon cues—a visible indicator of community feedback—will trigger users’ immediate perception of other users’ evaluations. As SFT (Zajonc, 1965) predicts, it is likely that lurkers or newcomers will be more willing to contribute in a community when they perceive positive evaluations of their community activity. Based on SIT’s central proposition of the immediacy gap in helping behavior, this positive atmosphere created by others’ evaluations and presence will be greater when users are specifically requested to help a recipient buddy who was assigned by the online buddy system (Karau & Williams, 1995). Thus, the interplay of SIT and SFT will reinforce users’ willingness to contribute in online communities.

H2a: When users comment on questions and their comments attract strong bandwagon ratings, they will perceive more positive evaluations from others’ presence than when the comments elicit weak bandwagon cues.

H2b: The more positive evaluations from others’ presence a user perceives, the greater his/her intentions to participate in the community will be.

H2c: Such effects will be stronger when users are assigned to specific recipient buddies than when they are not assigned to anyone.

Psychological Benefits of Bandwagon Cues in Online Buddy System

Thus far, two primary theoretical frameworks—namely, SIT and SFT—have bolstered the effects of the online buddy system and bandwagon cues on online community interfaces. While the two online community design features are expected to promote user contribution, they may also generate psychological benefits because of users’ participation. The following section will review previous studies that have shown positive psychological effects stemming from posting activities and online sharing.
**Sense of agency and sense of community**

When users post replies to existing questions on online message boards and receive feedback from community members, what psychological reactions will they exhibit? Conceptually, a sequence of activities performed by one user in an online community requires both self-initiated communication as an information source and others’ feedback on the information the user generates (Sundar, 2008; Sundar & Nass, 2001). While bandwagon cues function as a form of community feedback, when provider buddies (i.e., lurkers) take responsibility for their recipient buddies, they have the opportunity to practice self as source. When provider buddies provide adequate support to fulfill their recipient buddies’ needs, they will not only anticipate indirect interactions with other users as a form of community feedback but will also have the opportunity to practice self as source through the content creation itself.

Along these lines, Sundar (2008b) developed the idea of agency (Bandura, 1982) to explain users’ role in online communications. In this context, agency refers to “the degree to which the self feels that s/he is a relevant actor in the computer-mediated communication situation.” Because of this agentic aspect of online activities, a user can exert his/her own “influence over the nature and course of the interaction” (Sundar, 2008b, p. 61). Sundar’s (2008b) agency model of customization was developed from the centrality of the self as source and has been applied in various interface domains, such as customizable portals (i.e., Google news, netvibes.com) (e.g., Sundar & Marathe, 2010) and blogs (Stravrositu & Sundar, 2008). However, it can also provide a theoretical framework for online buddy systems in online communities. Freedom to take actions is a commonality across different online communication domains with respect to the psychological outcomes of being a source—namely, sense of agency.

Previous studies have found sense of agency to have a mediating role in encouraging user contribution. For instance, one study investigated the effects of bandwagon cues in blogging
(Stavrositu & Sundar, forthcoming). The study employed an experiment to elicit female bloggers’ psychological empowerment by providing a certain number of comments and visiting sites a certain number of times, both of which are widely used as indicators of bandwagon cues in blogs. The study found that a greater number of site visits led the users to feel competent, assertive, and confident in blogging (i.e., sense of agency). In addition, it found that a greater number of comments resulted in female bloggers feeling a greater sense of belonging to the community (i.e., sense of community). These two psychological states ultimately enhanced the level of psychological empowerment (i.e., sense of influence) the participants obtained from blogging (Stavrositu & Sundar, forthcoming). Therefore, both sense of agency and sense of community appear to be significant mediators in explaining why posting activity involving both self as source (i.e., content generation) and others as source (i.e., bandwagon cues) promote user engagement in community contribution.

Similar operationalizations of user content generation and bandwagon cues were tested in an online health message board to uncover the psychological mechanisms underlying users’ willingness to contribute to the online community (Kim & Sundar, 2011). The authors conducted a controlled lab experiment to employ four different bandwagon cues: the number of views, number of replies, the number of times the thread was shared, and the star ratings of the thread’s helpfulness. After participants posted a question on the stimulus webpage, they received either a greater number of views, a greater number of replies, a greater number of times the thread was shared, and a higher star rating for the thread’s helpfulness or a lower number in these bandwagon cues, which the researchers manipulated a week later. The community feedback delivering strong bandwagon cues (i.e., the number of visits, number of replies, number of times the thread was shared, and the star ratings of the thread’s helpfulness) made participants develop greater intentions to post on the message board and a stronger sense of community than weak cues. In particular, participants’ perceptions of how many times a thread initiated by their
question was shared by others seemed to positively affect their attitudes toward posting and their posting intentions as a result of how much sense of community and empowerment they felt (Kim & Sundar, 2011).

Given the similar posting activity to be driven by the online buddy assignment in the community interface and the bandwagon cues users’ activity (i.e., comments or replies) will receive, the current study anticipates similar psychological outcomes among users.

**H3:** When users’ replies to recipient buddies’ questions receive strong bandwagon cues, users will show a greater sense of agency (H3a) and sense of community (H3b) than when the replies receive weak bandwagon cues.

**H4:** The higher the sense of agency (H4a) and sense of community (H4b), the greater the level of positive attitudes toward posting.

**H5:** The higher the sense of agency (H5a) and sense of community (H5b), the greater the intention to post.

**Psychological states to boost contributors’ motivations**

Although the conceptual framework of users as sources (including both the self and others in the community) explains the operationalizations of the buddy concept and bandwagon cues, the body of literature exploring users’ motivations to contribute in online communities may provide richer explanations for why the buddy system in online sharing eventually promotes subsequent user contributions (Lampe et al., 2010; Mo & Coulson, 2010; Preece, Nonnecke, & Andrews, 2004; Ridings & Gefens, 2004; Wasko, & Faraj, 2000).

Three psychological motivations are particularly prominent for users to engage in and continue active contribution. Wasko and Faraj (2000) suggested that people are willing to share knowledge in online communities to obtain 1) actual benefits from the network (i.e., “tangible returns”), 2) psychological rewards from participation (i.e., “intangible returns”), and 3) perceived connectedness with the community network (i.e., “community interest”). The notion of
tangible and intangible returns is referred to in other studies using different terms, such as cognitive resources, instrumental aids, and emotional support (Ridings & Gefens, 2004). Researchers identified individuals’ motivations to join online communities using five online message board categories (i.e., health and wellness, personal interests, pets, professionals, and sports) administered via an open-ended question survey. The responses revealed six motivations: information exchange (49.8%), friendship (24%), social support (10.9%), recreation (8.7%), and a combination of technical reasons and common interest (1.7%) (Ridings & Gefens, 2004). Therefore, besides the immediate benefits from joining online communities, relationship motivation is one of the biggest advantages of joining a virtual community.

Through an online survey of 295 anonymous users and 304 account holders of a user-generated encyclopedia (i.e., Everything2.com), Lampe et al. (2010) found that both anonymous and registered users reported self-entertainment, satisfaction with the community, and belongingness to the community as major reasons for visiting the site. Especially for anonymous users, acquiring information and self-entertainment were the most prominent reasons of joining the community. Likewise, contributors were more interested in checking in on the community as a routine part of their lives because doing so brought them enjoyment. Another online survey of 340 members in HIV/AIDS online communities also found that those who posted questions and commented on others’ questions showed greater levels of enjoyment with the contribution itself, performed more altruistic behaviors, and had stronger feelings of connectedness with the community than members who only consumed others’ input (Mo & Coulson, 2010). In addition, a large number of MSN users in online discussion board communities ($N=1,188$) showed that contributors showed a greater sense of community than did lurkers. The study identified specific reasons that discouraged lurkers from contributing to online communities: 1) they did not value posting activities beyond owning a membership and browsing others’ posts (54%) or 2) they were reluctant to post out of shyness (28%) (Preece, Nonnecke, & Andrews, 2004). Therefore, it is
vital to generate self-driven motivations that not only highlight users’ own capabilities to help others but also the sharing activity itself and the resulting psychological bonding to the community.

Wasko and Faraj (2000) found similar reasons explaining why lurkers did not participate. Lurkers are not sure about their capability to contribute to communities, which leads to pointless commitment to the community in terms of reading ego-centric and sometimes abusive comments. Nonnecke and his colleagues (Nonnecke & Preece, 1999; Nonnecke et al., 2004) also found that people do not want to participate in content contribution because they do not see clear benefits from posting, do not feel strong ties to the community, and/or lack confidence about posting due to others’ evaluations. Furthermore, community attachment is a critical element of users’ motivation to stay longer and contribute more in a community. Research has shown that users have greater intentions to contribute to a community when they feel belongingness to the community (Kollock, 1999; Lampe et al., 2010).

Accordingly, if the online buddy system works properly in terms of initiating natural interactions and eliciting the positive effects of bandwagon cues, provider buddies (i.e., lurkers or newcomers) will likely perceive there to be psychological benefits of community contribution, such as enjoying the activity, feeling a sense of community, or developing self-confidence through their contributions, which will, in turn, increase their willingness to contribute further to the community. Users’ feelings helpfulness to their recipient buddies is also vital to lead to positive intentions to contribute further in the community. Thus, it is presumed that when users have a direct experience helping someone via the online buddy system, they will likely exhibit the psychological benefits contributors usually express from posting, such as perceived competence, perceived helpfulness, and perceived enjoyment, in addition to the two psychological outcomes identified earlier: sense of agency and sense of community. Although they are only temporary,
these psychological benefits will lead to increased intention to contribute to the community. Thus, the following hypotheses are posited:

**H6:** When users actually help their recipient buddies and their posting activity receives strong bandwagon cues, they will show higher levels of helpfulness to their buddies (H6a), and feel greater perceived competence in (H6b)—and enjoyment (H6c) of—the posting activity, than when their posting activity receives weak bandwagon cues.

**H7:** These psychological outcomes of posting will mediate the effect of the online buddy and bandwagon cues on posting attitudes (H7a) and intentions to contribute to the community (H7b).

**Psychological Reactance: Unintended Effects of the Online Buddy System and Bandwagon Cues**

Some might argue that both the online buddy system and bandwagon cues could have negative effects such that lurkers might suffer from hidden pressure related to being responsible for their buddies and being evaluated by the community. It might not be desirable to force users to initiate interactions in free, voluntary, anonymous, online communities. It is disputable that forcing users to complete such a task (i.e., initiate interactions) could increase their psychological stress due to pressure. Berkowitz (1973) suggested that freedom of choice is a critical factor in influencing one’s willingness to help someone in need. Reactance toward social responsibility emerges from situations in which an individual is asked to make a decision, especially for a favorable decision. This psychological reactance is “a motivational state that aims at restoration of the choice of freedom” (Brehm & Cole, 1966, p. 420). For instance, in one study, when people realized they were the only individual who could help a person in need, they reported a greater degree of responsibility for the situation than those who believed there was another adult who could help. However, they also tended to deny the situation by reporting a higher degree of suspicion of the situation’s authenticity. That is, in this case, they did not believe that a fight among youngsters was real (Latane & Darley, 1970, pp.81-85). In addition, when individuals
realize their responsibility is extended to future incidences, they tend to avoid the situation even before it occurs (Jones, 1970). Therefore, cases that confine individuals’ freedom to make decisions about their actions could lead to possible resentment with regard to social expectations toward pro-social behaviors.

As such, it is evident that anonymity provides online community users flexibility when deciding to take an action or not. Because people are unable to recognize who they are, users do not feel any obligation to help others despite the benefits they receive from the community. Therefore, it is feasible that specifically assigning an online buddy to one user might induce psychological reactance to the given duty. One caution should be addressed with regard to such a possibility. Previous studies have discovered that individuals often begin feeling resentment from the pressure generated by responsibility mostly in the context of direct physical contact with a support recipient (e.g., Bopp et al., 2007). However, the actions that users take in online communities do not necessarily lead to real physical contact. The only action users need to perform is commenting/responding to an original question/request from their recipient buddies. Therefore, the same reactance toward a social obligation in the online buddy system may not occur like it does in offline social interactions.

R1: Will users assigned to a recipient buddy be more likely to perceive pressure to help and, therefore, be less inclined to help than those who do are not assigned a recipient buddy?

While bandwagon cues seem to signal a healthy participatory online community, they may also cue negative thoughts and feelings. The fact that a site offers such cues might signal the existence of an evaluative component for contributions. As with all evaluations, potential contributors are likely to feel some apprehension about how well they will be received by the community. Such evaluation apprehension triggered by bandwagon cues may concern users about their ability to contribute compared to when they have no pressure from such evaluations by
others. Kraut (2003) proposed a connection between social loafing and social pressure in a collaborative work setting with regard to evaluation apprehension. In group work settings, individual members are often concerned about who will judge their performance and how low the evaluation will be. Specifically, Diehl and Stroebe (1987) demonstrated the effects of working style (i.e., group vs. alone), assessment style (i.e., collective vs. personal), and levels of evaluation apprehension (i.e., low vs. high) on one’s productivity in brainstorming. They found that both expert judges and peers mentioned being more concerned about potential criticisms of their idea generation when they were informed that the evaluation would be attributed to each individual, not the group, regardless of the working style. However, they also found that the effect of evaluation apprehension is greater when expert members are present to evaluate other members in the same group. Similarly, Collaros and Anderson (1969) conducted an experiment that manipulated the prominence of expertise among members in a group. They found that when evaluators’ possessed a high level of expertise, members’ apprehension of their evaluations of a task (i.e., brainstorming activity) resulted in poorer performance compared to conditions in which there was no evaluation.

In the case of the online buddy system, evaluation apprehension is likely to occur only when provider buddies’ postings receive weak bandwagon cues, which will, in turn, lower their intention to contribute to the community. When provider buddies receive good community feedback via strong bandwagon cues, their evaluation apprehension might be diminished such that the social pressure for high-quality community participation may diminish. On the other hand, weak bandwagon cues may accentuate their evaluation apprehension due to lack of community approval for their performance.

**H8:** *When a user’s posting activity receives weak bandwagon cues, the level of perceived evaluation of the activity will be greater than when it receives strong bandwagon cues.*

**H9:** *The feeling of being evaluated by others will mediate the effects of bandwagon cues on posting attitudes (H9a) and intention to post (H9b) in the online community.*
This dissertation investigates the effects of the online buddy system and bandwagon cues on users’ attitudes and intentions toward sharing in online communities. The key psychological variables that may prompt users’ contribution are perceived responsibility and social presence of other community members, as proposed by social impact theory (SIT) and social facilitation theory (SFT) respectively. The online buddy and bandwagon cues may also contribute to other psychological variables, such as sense of agency, sense of community, perceived helpfulness, perceived competence, and perceived enjoyment for user contribution. In order to be
comprehensive, this study also speculates potential threats of implementing both the online buddy system and bandwagon cues in the same interface by investigating users’ psychological reactance to perceived responsibility and potential evaluation of their contributions by others.
Chapter 2

Methods

A 2 (online buddy: absence vs. presence) x 2 (bandwagon cues: low vs. high) between-participants experiment was designed for the current study. A stimulus website was constructed for a controlled lab experiment, and four different versions of the website were created to operationalize the four different experimental conditions. Online health communities were chosen as the particular domain for testing the study model because of the need to address under-contribution issues in health-related online communities (Fox & Jones, 2009). The current study specifically focused on the topics of diet and nutrition. Baxter, Egbert, and Ho (2008) found that this particular health topic is popular among college-aged students, which is the predominant sample for this study. Furthermore, students do not require a high level of expertise on the topic as it is closely related to their daily lives.

In order to optimize the effects of the online buddy system by simulating a large online community, the study website indicated that it had about 250 daily visits. This community-size indicator is an important influence on participants' first impressions of the community. This number of visits was chosen deliberately with the expectation that it would make participants perceive a sense of community vitality. Research suggests a community that is too large may prompt individuals to lurk around a website, especially when they first visit the site (e.g., Butler, 2011; Valacich, Dennis, & Nunamaker, 1992). Specifically, Voelpel et al. (2008) found that communities with 100–250 participants resulted in fewer replies and lower-quality replies than those from communities of 0–99 participants.
Participants

In all, 100 undergraduate students participated in the study. They were recruited from several communication classes at Penn State. Of the students, 78% were female, and the mean age was 20.62 years old. The majority of participants were white (68%), followed by Asian (12%), Hispanic (9%), black (7%), and others (4%). Participants received extra credit in exchange for their participation in the two study sessions. Participants came to the Media Effects Research Lab to complete the first session, and they completed the second session online two days later at a location of their own choosing.

Stimulus Website

The stimulus website allowed participants to log in by creating their own account (i.e., institution account) and password. When the participants created an account, they were asked to provide basic information about their interest in the topic (i.e., diet and nutrition) that would be shared in the community. The questions included their diet style (e.g., meat lover, vegetarian, etc.), exercise per week, relevant health information, gaining and information-seeking behaviors (e.g., media exposure, online health information search habits, etc.), prior experience with online communities, and social media usage. Personal demographic information was not gathered at this stage in order to make participants feel their privacy was upheld on the site. Before creating an account, participants were also informed about the confidentiality and anonymity of the information they would provide on the site.

This account creation and system login had three goals. First, logging into the system created authenticity for the website as it simulated very common online environments that most of the participants probably visit every day. Second, it also allowed the study to provide the
participants with an appropriate rationale for assigning them a recipient buddy. The instructions for the online buddy condition stressed the automatic system-based generation of an online buddy assignment. Lastly, each participant account allowed the account owner to view the thread with previous activity. Restricted exposure to each participant’s activity on the site was critical to the current study; otherwise, all the participants would be exposed to other participants’ postings and bandwagon manipulations. The researcher was able to access participants’ account information in order to manipulate bandwagon cues. To avoid any effects from the content itself, the participants read an equivalent amount of information in the postings across the conditions. The sections for independent variables below further describe the strategies employed to rule out potential confounding effects stemming from the content and bandwagon cue manipulations.

The main page of the website consisted of a list of seven recently updated postings, in addition to default community menus, such as My Page, FAQ, and Research, on the left-hand side of the main site page. The list of postings on the main page included a partial title of each posting, information about the author of the posting, and the number of replies to threads for each posting (see Figure 2-1). The Forum page included the main question posting and replies to the question. The structure of the thread was nested such that users could leave a reply to the original question, and their reply could have replies by other users (i.e., researcher accounts). This nested design for the threaded messages was especially important because it allowed the researcher to manipulate bandwagon cues on participants’ replies rather than on the entire communication thread in which the participants’ replies were situated.
Figure 2-1: Before a user logs in (top), when the user creates an account (middle), and after the user logs in (bottom)
Participants in both the online buddy and regular board conditions were asked to reply to the original postings (i.e., questions from one of the community members) assigned to them via the online buddy system. For participants to leave a reply to a question, the website directed them to My Page. In My Page, participants could check their activities in the community. My Page looked similar to other user account pages in online communities and included a record of the participants’ most recent activities, as well as a list of their recent activities. My Page also included a message box, which is a typical feature of any user account page. My Page was vital to the current study design because online buddy assignment occurred in this space (see Figures 2-2, 2-3). The FAQ and Health & Life pages included general questions and answers commonly found in online community websites, along with relevant information available on the website for student health at Penn State.

**Independent Variables**

The first independent variable for this study was the presence/absence of an online buddy. The online buddy was operationalized as a recipient buddy—namely, a particular community member the participant would help by providing appropriate support. Each participant served as a provider buddy for a specifically assigned online buddy. The one-on-one assignment of an online buddy to each study participant in the online buddy condition was expected to increase participants’ social responsibility. Participants were asked to reply directly to a posting from My Page in the online buddy condition. Participants were informed that their recipient buddy assignment was generated based on the user information they provided when creating their account.
The buddy assignment was conducted in My Page (Figure 2-2). For the online buddy condition, My Page included partial title links for five questions posted by community members (i.e., Choose your buddies for today!), in addition to the default information about the participant (i.e., provider buddy), as described earlier. Each question in the list of links included author information, such as “kzs1420 asked about Protein without Meat.” When the participant moused over the link to click it, bubble pop-up instructions appeared with the message “Click the posting to reply! Be a buddy today!” When the participant clicked one of the links, s/he was directed to a thread page, which included the recipient buddy’s original question.

Figure 2-2: Screenshot of My Page for the online buddy condition

The buddy assignment was conducted in My Page (Figure 2-2). For the online buddy condition, My Page included partial title links for five questions posted by community members (i.e., Choose your buddies for today!), in addition to the default information about the participant (i.e., provider buddy), as described earlier. Each question in the list of links included author information, such as “kzs1420 asked about Protein without Meat.” When the participant moused over the link to click it, bubble pop-up instructions appeared with the message “Click the posting to reply! Be a buddy today!” When the participant clicked one of the links, s/he was directed to a thread page, which included the recipient buddy’s original question.

Figure 2-3: Screenshot of My Page for the non-buddy condition
My Page for participants in the regular board condition also included a list of five question links under the title “Questions,” as well as the default information about their activity in the community website. However, author information associated with the questions did not appear in the regular board condition. When participants in this condition moused over the question links, bubble pop-up instructions also appeared with the message “Click postings to reply!” (Figure 2-3).

The second independent variable represented the two types of bandwagon cues—the number of responses to participants’ replies and star ratings for their replies’ helpfulness. The bandwagon cue was a visual indicator that signaled the popularity of a particular posting on the message board and represents cumulative feedback from other community members. Common bandwagon cues are the number of views, the number of replies, the number times the thread has been shared, and star ratings. This set of bandwagon cues has been shown as a strong indicator of bandwagon effects (Kim & Sundar, 2011). Each reply that the participants (i.e., provider buddies) left for their recipient buddies received a predetermined number of replies from other members and a predetermined helpfulness star rating depending on the experimental condition. Participants had either a great number of replies (i.e., 12 replies) and four star ratings in the strong bandwagon cue condition or a small number of the replies (i.e., two replies) and one star rating in the weak bandwagon cue condition (see Figure 2-4).
Figure 2-4: Example screenshots of bandwagon cue manipulations in My Page (weak in the regular board condition above and strong in the online buddy condition below)
A native-speaking undergraduate assistant manipulated replies for both the high and low bandwagon conditions. The assistant generated two core replies to the participants’ replies on the message board, in addition to 10 agreement-style replies only used in the strong bandwagon cue condition. Previous studies have shown this method of manipulating replies to be effective in controlling content effects (Kim & Sundar, 2011; Sundar, Go, Kim & Zhang, 2012). The basic strategy of crafting replies was to confirm that the information the participants left in their replies was relevant to the original question and to provide additional information about the topic. The additional information was validated from different academic resources, such as the American Journal of Clinics and Nutrition, Cancer.org, The New York Times, etc., by the undergraduate assistant before the manipulation (Figure 2-5).

Figure 2-5: Example screenshot of bandwagon cue manipulations (weak) on the thread page
Dependent Measures

All the measurement items were measured using nine-point Likert or Likert-type scales. The complete list of measurement items is available in Appendix B. The current study measured participants’ attitudes toward posting activity by asking them to evaluate the activity they performed in the online community using an index of four adjectives (i.e., beneficial, wise, enjoyable, and necessary; $\alpha_{session\ 1} = .93; \alpha_{session\ 2} = .93$) (Ajzen & Fishbein, 1980; Furnham & Lovett, 2006; Kim & Sundar, 2011). To predict behavior, this study employed a scale used in Kim and Sundar’s study (2011), which consists of a set of statements that measure participants’ willingness to behave in a particular activity context (i.e., posting on a message board) (three items; $\alpha_{session\ 1} = .92; \alpha_{session\ 2} = .90$) (Ajzen & Fishbein, 1980; Fishbein, 2008). Posting behavior was directly measured by recording whether or not participants posted a comment and how many times participants provided replies to existing questions in the message board in both the online buddy and regular board conditions.

Attitudes toward the website could be composed of a variety of psychological responses, including cognitive assessment of the site and emotional reactions. Such experiences form a meaningful dimension of user psychology in online health communities. Thus, attitudes toward the online community website were also measured. The study employed two sets of measures used in previous studies (Lin, 2007; Kalyanaraman & Sundar, 2006; Kim & Sundar, 2011). In one study, Lin (2007) found a strong positive relationship between attitudes toward the website and individuals’ intentions to remain on the website. The current study speculated that such a positive relationship between users’ attitudes toward the website and their intentions to maintain membership with the website would be parallel to the relationship between attitudes toward the online community website and behaviors performed on the website and on similar online community websites. Therefore, the study asked participants to indicate their degree of
favorability of the website using two statements ($r_{session\,1} = .86$; $r_{session\,2} = .72$; $p < .0001$) adopted from Lin (2007) and an index of 13 adjectives to describe their feelings toward the website (Kalyanaraman & Sundar, 2006; Kim & Sundar, 2011). The attitude adjective index was grouped into two separate factors, as indicated by a confirmatory factor analysis. The first factor reflected an affective dimension of participants’ attitudes toward the website (i.e., useful, positive, good, favorable, and likable; $\alpha_{session\,1} = .94$; $\alpha_{session\,2} = .96$) whereas the other factor represented the arousing dimension of their attitudes (i.e., exciting, entertaining and stimulating; $\alpha_{session\,1} = .92$; $\alpha_{session\,2} = .92$). Five items from the original index used in both sessions were dropped for the main analysis due to cross-loading issues.

Mediating Variables

The current study measured a series of mediating variables between the effects of the independent variables and the dependent variables based on the study models. Perceived responsibility referred to the degree to which the participant felt “personally accountable and responsible for” the assignment given to help someone else in the community website (Hackman & Oldham, 1975, p. 162). Previous studies assumed the level of social responsibility to be a function of differences in one’s willingness to help a needy person in a public space (e.g., Shaffter et al., 1975) or of contribution rates in online communities (e.g., Karau & Williams, 1995). These studies did not directly measure the psychological state resulting from one’s perceived responsibility for the incidence. Therefore, the current study modified a scale from research done in an organizational setting with regard to one’s perceived responsibility (Hackman & Oldham, 1974; Pearce & Gregerson, 1991). Examples of the items are “The site gives me considerable opportunity for independence and freedom in how I help others in the community,”
and “Whether or not the work gets done right is clearly my responsibility” (12 items; $\alpha_{session 1} = .82; \alpha_{session 2} = .76$).

Social presence as a result of the positive effects of the bandwagon cues was operationalized as the “degree of salience of the other person in a mediated communication and the consequent salience of their interpersonal interactions” (Short, Williams, & Christie, 1976, p. 65). The current study applied the concept of social presence (Gefen & Straub, 2003) to the perceived presence of others because of the positive valence of feelings resulting from interacting with others in the online community when bandwagon cues facilitated user contribution. Therefore, the presence of others in the form of collegiate relationships with others in the community was a measure in the first model of the study, which expected the online buddy and bandwagon cues to have positive effects (five items; $\alpha_{session 1} = .91; \alpha_{session 2} = .95$).

On the other hand, perceived evaluation was measured by directly asking participants about their perceptions of the other users’ evaluations of their performance (i.e., posting activity) in the community. Hall and Henningsen (2008) initially operationalized the presence of others as a computer icon shown on the screen while participants performed a task (i.e., typing). Examples of the items include “I felt like my performance was evaluated” and “My activity on the message board was being observed” (seven items; $\alpha_{session 1} = .75; \alpha_{session 2} = .76$).

Psychological reactance was assessed by measuring the degree to which the website caused participants to demonstrate a lack of compliance with the information/advice on how they behaved with regard to the health topics discussed in the online community site. The psychological reactance scale has been well supported as an individual trait measure (Hong & Faelda, 1996). Since few studies have directly measured the state of one’s psychological reactance in a given situation, the individual trait scale measure was re-worded for the perceived psychological reactance measure in this study (e.g., “This online community triggered a sense of
resistance in me” and “I considered advice from others and the online community to be an intrusion”) (four items; $\alpha_{session 1} = .81; \alpha_{session 2} = .86$).

Sense of agency was measured by asking participants to rate how they felt about their competence, assertiveness, and confidence with regard to their posting activities on the message board (three items; $\alpha_{session 1} = .85; \alpha_{session 2} = .91$). Sense of community, on the other hand, was measured by asking participants to rate their expectations for interactions with other members in the community (12 items; $\alpha_{session 1} = .92; \alpha_{session 2} = .91$) (Kim & Sundar, 2011).

Perceived helpfulness referred to the degree to which participants recognized acknowledgement of their activity by other members in the community (van Uden-Kraan et al., 2008). van Uden-Kraan et al. (2008) measured five constructs that psychologically constituted one’s empowerment while sharing social support in online patient groups. Five items from the measurement specifically captured one’s perception of being helpful so that other group members would assure him/her that s/he was a good example of a contributor. Modified items were “In this online support group, how likely do you think it would be for: (1) someone to ask for your help or advice, (2) you to be an example to other participant[s], and (3) you to offer advice and support to others?” (three items; $\alpha_{session 1} = .88; \alpha_{session 2} = .92$)

Perceived competence was extracted and modified from Ryan and Deci’s Intrinsic Motivation Inventory Scale (e.g., Ryan, Koestner & Deci, 1991). Participants reported their feelings about their capability of completing the task (i.e., posting activity) after their initial interaction with other group members or their visits to the community website. Examples of items are “I was pretty skilled at this activity” and “I am capable of posting a message on the board” (seven items; $\alpha_{session 1} = .88; \alpha_{session 2} = .91$).

Perceived enjoyment was measured by asking participants if they perceived the activity in the community as a pleasant experience. Ryan, Deci, and their colleagues (e.g., Ryan, 1982; Ryan, Koestner & Deci, 1991; Deci, Eghrari, Patrick, & Leone, 1994) argue that one’s interest
and enjoyment with activities will lead to his/her intrinsic motivation to continue the activity.

Examples of the items to measure perceived enjoyment are “I thought this activity was interesting,” “This activity was fun,” and “I felt good when doing this activity” (15 items; $\alpha_{session\ 1} = .82; \alpha_{session\ 2} = .80$).

**Control Variables**

People tend to comply with predominant norms in situations, which leads them to behave in ways that others consider right and ideal. *Social desirability* is defined as “a need for social approval and acceptance and the belief that this can be attained by means of culturally acceptable and appropriate behaviors” (Marlowe & Crowne, 1961, p. 109). This social desirability trait might affect users’ contribution intentions when they are assigned an online buddy or even in regular online message boards because the community to which they belong expects their participation. Therefore, when users are assigned an online buddy, their need for social approval might become particularly conspicuous compared to general online message board settings. On the other hand, the effect of social desirability might not hold in a setting where users’ anonymity is secured. As a result of the nature of online communities, participants may feel free from such social obligations regardless of the presence of the online buddy. However, this anonymity effect on the social desirability among users may be assuaged when participants realize the presence of other users in the community. Social desirability may also alter results when participants feel that other users either approve or disapprove of their activity based on bandwagon cues. Therefore, a shortened version (Fleming & Zizzo, 2011; Stöber, 2001) of the original social desirability scale (Crowne & Marlow, 1961) was used for the current study (14 items; $\alpha = .67$).

A similar construct—participants’ social responsibility—was also taken into account as an individual difference variable in this study. Harris and his colleagues (1954a; 1954b)
developed the original 89-item scale measuring social responsibility, specifically focusing on children’s attitudes and behaviors (Harris, 1957). They referred to social responsibility as “a composite of attitude elements reflecting behavior classifiable as reliable, accountable, loyal, or doing an effective job” (Harris, 1957, p. 322). Later, Berkowitz and Daniels (1964) adopted this social responsibility scale to show the correlations between one’s social responsibility traits and the degree to which college students exerted helping behavior toward someone and whether the relationship was dependent on experiencing prior help from that person. The study showed a strong positive correlation between one’s social responsibility and the helping behavior (i.e., productivity of boxing) ($r = .49, p = .05$) only when the person had received prior help and was aware that productivity would be evaluated based on others’ performance as well. Although not identical, online community settings could induce a similar atmosphere with such give-and-take or take-and-give situations. Therefore, the current study assumes that an individual’s social responsibility will influence the relationship between the two main independent variables and the psychological outcome variables (11 items; $\alpha = .79$).

Another individual difference variable that needs to be noted because of its relevance to online information sharing is one’s altruism. Altruism has been defined as an individual’s willingness to perform for others’ benefit rather than for personal reward (e.g., Berkowitz, 1970; Krebs, 1982, Dovidio, 1984). Therefore, it is presumed that one’s altruism could alter the original effects of having an online buddy on outcome variables because it might neutralize any feeling of responsibility induced by the buddy assignment. Thus, the study used a revised version of the altruism scale modified by Rushton, Chrisjohn, and Fekken (1981) and controlled for this effect in the analysis (20 items; $\alpha = .89$).

Lastly, people’s tendency to be swayed by others’ opinions and thoughts was the last personal trait variable to be controlled for in the study. Bandwagon cues—one of the independent variables—influence individuals’ perceptions of how other people actually evaluate content.
Other-directedness, a sub-scale of the self-monitoring scale, refers to “a willingness to change one’s behavior to suit other people” (Brigg, Cheek, & Buss, 1980, p. 679). Such a dependency trait could yield different degrees of the effects of bandwagon cues because people with a greater degree of other-directedness are more prone to influence based on how others evaluate information people supply. This could be either a positive or negative bandwagon influence depending on the strength or weakness of such cues, respectively (nine items; \( \alpha = .85 \)).

Participants’ general online sharing experiences in their daily lives might also influence the current study’s outcomes. Thus, participants were asked to report their prior experience with online sharing, including social media (e.g., Facebook) and e-commerce websites (e.g., Amazon.com) (Kim & Sundar, 2011). Participants’ health topic involvement (Zaichkowsky, 1985) (12 items; \( \alpha = .96 \)) and task involvement (Kalyanaraman & Sundar, 2006) (11 items; \( \alpha_{\text{session 1}} = .87; \alpha_{\text{session 2}} = .90 \)) were also measured as a control for their baseline interest in the community site and their posting activity during the study session.

**Procedure**

Upon arrival, participants were instructed to sit in front of one of the computers in the lab. As soon as they were seated, they were given a study ID (i.e., a unique combination of letters and numbers but not their student ID). After signing an informed consent form, participants completed the pre-questionnaire, which included the individual difference variables of social desirability, altruism, social responsibility, and other-directedness and asked participants about their general online information-seeking behaviors in various online platforms. Participants then watched video instructions that described the entire study procedure and demonstrated how to browse the study website. The researcher created two versions of the video instructions, one for each buddy variable condition—namely the online buddy condition and the regular board
condition. The participants were informed that the study consisted of two consecutive sessions that would occur within one week but that they did not need to take any particular actions on a regular basis. To ensure an adequate level of task involvement among participants, a cover story was given. Participants were told that the study website was a health forum for all Penn State students that was currently undergoing student usability testing. Therefore, the participants were instructed that the major task for them would be to evaluate the site by taking a site tour and possibly participating in the forum. The video instructions also informed participants about how to create a user account for the site, how to find questions on My Page, and how to reply to questions on the site. To enhance the online buddy manipulation, participants were asked to read an extra printed copy that explained the website’s online buddy system (see Appendix A for the exact script). This printed version of the information was available beside the computer.

After watching the video tutorial, participants created their account and logged into the study website. The instructions required them to click the My Page link to determine what questions were available on the website. When they clicked one of the postings on My Page, they found an original question with either one core reply and one agreement reply to the core reply or no reply at all.

They were instructed to contribute to the community as they would normally do in any other social media site. This procedure allowed the study to measure actual posting behavior. Once participants posted replies and/or confirmed they had finished browsing the study website, they continued to complete the main questionnaire for Session 1. Log data of the site tracked whether the participants clicked the FAQ or Health & Life sections to get additional information from the site.

Participants who posted replies in Session 1 received a follow-up email with instructions two days after their initial participation. In the email instructions, they were asked to follow three steps. First, they read a brief introduction for what they would do in Session 2 (i.e., reminder for
the online buddy manipulation) and information about bandwagon cues. Second, they were asked to click thank-you messages from their online buddies (i.e., recipient buddies who they helped in Session 1) or a welcome message from the website. They were also asked to click a link for their last posting on My Page when logging into the study site. Then, they were told to check the bandwagon cues generated for their own posting. Two bandwagon cues appeared right next to the title of the posting that they clicked on My Page. Lastly, they were told to click the main questionnaire link on My Page to conclude their study participation. Those who did not post any reply in Session 1 also received a follow-up email two days after Session 1. However, these participants’ responses to the second main questionnaire were not included in this study because their participation did not include a bandwagon cue manipulation (n = 10).

**Data Analysis**

Multivariate analysis of covariance (MANCOVA) followed by univariate analyses of covariance (ANCOVA) and correlations tests comprised the data analysis plan for testing the hypotheses and research question. Mediation analysis using a moderated mediation analysis macro developed by Hayes (forthcoming) was also conducted. This particular analysis method allowed the current study to test conditional mediation effects between two independent variables on attitudinal and behavioral outcome variables. In addition to identifying one or more mediating variable(s) between the independent and dependent variables, moderated mediation testing specifies “when” the effects of the primary independent variable on the dependent variables can be mediated by the intervening variables depending on the moderators, which are treated as secondary independent variables (Hayes, forthcoming). Therefore, moderated mediation testing would show which value of the bandwagon cue manipulation—weak or strong—led to a mediated effect of the online buddy on attitudes toward posting, attitudes toward the website, and behavioral intentions via mediators proposed in the study model.
To confirm that any changes between the two sessions were an effect of online buddy reinforcement through buddies’ thank-you messages, repeated-measured ANOVA was also conducted in addition to the main hypothesis testing.
Chapter 3

Results

Manipulation Effectiveness

Four statements asked participants whether they thought the website had given them a certain number of particular community members so that they were able to provide help that those community members needed (α_{session 1} = .81; α_{session 2} = .74). When an index was created using all four items of the online buddy manipulation measured in both sessions, the index showed a statistically significant difference between the online buddy and non-buddy conditions (one-tailed \( t_{(98)} = 1.60, p = .05 \)) in the predicted direction. Therefore, the success of the ontological manipulation of the online buddy variable is evident.

Table 3-1: Recall measure of the number of replies

| Approximately, how many people would you say REPLIED to your posting on the message board? | Condition |
| --- | --- | --- |
| Participants’ Recall | 12 Replies | 2 Replies | Total (%) |
| Fewer than 3 | 8 | 47 | 55 |
| More than 3 but fewer than 10 | 11 | 3 | 14 |
| More than 10 | 31 | 0 | 31 |
| Total (%) | 50 | 50 | 100 |

\( \chi^2_{(2, 100)} = 63.22, p < .0001 \)

The bandwagon cue manipulations were also successful. Participants answered two different questions asking them to indicate the actual number of replies to their posting and the number of helpfulness rating stars their posting received. Participants were also asked their perceptions of those numbers in terms of their levels (high or low). Both recall and perception measures showed significant differences between the two bandwagon cue conditions such that
participants in the strong bandwagon cue condition reported greater numbers of replies and helpfulness rating stars and perceived them as higher than those in the weak bandwagon cue condition. See Tables 3-1, 3-2, and 3-3 for details of the analysis.

Table 3-2: Recall measure for the number of helpfulness rating stars

<table>
<thead>
<tr>
<th>How many stars did your post receive?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants’ Recall</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>One Star</td>
</tr>
<tr>
<td>Two Stars</td>
</tr>
<tr>
<td>Three Stars</td>
</tr>
<tr>
<td>Four Stars</td>
</tr>
<tr>
<td>Five Stars</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

\[ \chi^2 (2, 100) = 75.9, p < .0001 \]

Table 3-3: Perception measures of both bandwagon cue manipulations

<table>
<thead>
<tr>
<th>Perceived Replies</th>
<th>Weak ((n = 50))</th>
<th>Strong ((n = 50))</th>
<th>(t)-ratio ((DF = 98))</th>
<th>(p)-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too few–Too many</td>
<td>3.5 1.63</td>
<td>5.24 1.17</td>
<td>6.13</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>Not at all–Very helpful</td>
<td>3.66 1.53</td>
<td>6.88 1.52</td>
<td>10.54</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

**Online Buddy Effectiveness on Perceived Responsibility and User Participation Intention**

H1a anticipated that the online buddy system would induce a greater degree of perceived responsibility among participants than would the non-buddy condition. The results of an ANCOVA revealed there were no significant differences between the online buddy \((M_{\text{Adjusted}} = \)
4.70, \( SE = .14, n = 49 \) and non-buddy conditions (\( M_{\text{Adjusted}} = 4.77, SE = .14, n = 51 \)) on participants’ perceived responsibility when health topic involvement, task involvement, and the four individual difference variables were entered as covariates in the model (\( F_{(1, 92)} = .12, p = .73 \)). Therefore, H1a did not receive statistical support.

H1b predicted positive correlations between perceived responsibility and the behavioral intention to post, as well as actual posting behavior (i.e., the number of comments), in the online community website. A strong correlation was found between perceived responsibility and posting intention (\( r = .84, p < .0001, n = 100 \)) but not between perceived responsibility and the number of comments posted. Therefore, the data demonstrated partial support for H1b.

**Testing the Effects of the Online Buddy and Bandwagon Cues on SIT, SFT, and Psychological Motivation for User Contribution**

The second set of the hypotheses (i.e., H2a, H2b, and H2c) predicted the effects of bandwagon cues on positive psychological feelings with regard to others’ presence. In addition, H3a, H3b, H6a, H6b, and H6c predicted that both independent variables would have effects on a variety of motivation-related psychological variables: sense of agency, sense of community, perceived helpfulness, perceived competence, perceived enjoyment, posting attitude, and posting intention. A 2 (online buddy) X 2 (bandwagon cues) MANCOVA\(^1\) found a marginally significant main effect for the online buddy (Wilks’ \( \Lambda = .09, F_{(9, 82)} = 1.74, p = .09 \)).

Specifically, the online buddy condition yielded a marginally significant main effect on social presence (\( F_{(1, 90)} = 3.70, p = .06 \)). The non-buddy condition yielded a greater level of social presence (\( M_{\text{Adjusted}} = 5.94, SE = .20, n = 51 \)) compared to the online buddy condition (\( M_{\text{Adjusted}} = 5.39, SE = .20, n = 49 \)). This direction of the degree of social presence between the two online

\(^1\) Covariates included in the analysis are health topic involvement, task involvement (Session 2), and four individual difference variables.
buddy conditions appeared to be opposite from what the study initially predicted. Thus, the study did not receive any statistical support for H2a, H2b, or H2c. Similarly, the online buddy manipulation produced a significant main effect on sense of community ($F_{(1, 90)} = 6.87, p < .05$). Participants in the non-buddy condition scored higher ($M_{Adjusted} = 5.08, SE = .16, n = 51$) than their counterparts in the online buddy condition ($M_{Adjusted} = 4.47, SE = .16, n = 49$). The direction of sense of community was also opposite from the original prediction. The intention to post also showed a marginally significant difference as a function between the two conditions ($F_{(1, 90)} = 3.64, p = .06$). Again, the non-buddy condition produced greater intention to post ($M_{Adjusted} = 4.40, SE = .22, n = 51$) than did the online buddy condition ($M_{Adjusted} = 3.79, SE = .23, n = 49$), counter to the prediction.

Univariate analyses also revealed a marginally significant main effect for bandwagon cues on the intention to post ($F_{(1, 90)} = 3.12, p = .08$). The strong bandwagon cue condition produced a greater intention to post ($M_{Adjusted} = 5.93, SE = .17, n = 50$) than the weak bandwagon cue condition ($M_{Adjusted} = 5.50, SE = .17, n = 50$).

Marginally significant interaction effects between the online buddy and bandwagon cues were also found for perceived helpfulness ($F_{(1, 90)} = 3.53, p = .06$) and social presence ($F_{(1, 90)} = 3.55, p = .06$) (Figure 3-1). The patterns of these two-way interactions indicated that strong bandwagon cues either increased the effects or made them persist longer when participants had online buddies. However, when participants did not have online buddies and received strong bandwagon cues, they showed a decrease in perceived helpfulness, social presence, and posting attitudes than when they received weak bandwagon cues. Thus, this study failed to provide statistical support for H2s, H3s, and H6s, which predicted positive effects for the online buddy and bandwagon cues on the function of psychological motivator variables: perceived responsibility, social presence, perceived helpfulness, perceived competence, and perceived enjoyment.
H4a, H4b, H5a, and H5b further probed the positive relationships between sense of agency and sense of community and posting attitude and intention. A series of correlation tests showed strong positive correlations between sense of agency, sense of community, social presence, perceived helpfulness, perceived enjoyment, and perceived competence and two dependent variables: posting attitude and intention (see Table 3-4 for zero-order correlations).

Figure 3-1: Interaction effects between the online buddy and bandwagon cues (Session 2)
Table 3-4: Zero-order correlations among measured variables

<table>
<thead>
<tr>
<th></th>
<th>SoA</th>
<th>SoC</th>
<th>SP</th>
<th>PH</th>
<th>PJ</th>
<th>PC</th>
<th>PE</th>
<th>PA</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoA</td>
<td>1</td>
<td>.33**</td>
<td>.51***</td>
<td>.53***</td>
<td>.13</td>
<td>.69***</td>
<td>.52***</td>
<td>.63***</td>
<td>.27**</td>
</tr>
<tr>
<td>SoC</td>
<td>1</td>
<td>.52***</td>
<td>.60***</td>
<td>.50***</td>
<td>.41***</td>
<td>.20*</td>
<td>.59***</td>
<td>.67***</td>
<td></td>
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<tr>
<td>SP</td>
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<td>.63***</td>
<td>.28**</td>
<td>.46***</td>
<td>.54***</td>
<td>.68***</td>
<td>.46***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PH</td>
<td>1</td>
<td>.28**</td>
<td>.61***</td>
<td>.64***</td>
<td>.62***</td>
<td>.42***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PJ</td>
<td>1</td>
<td>.26**</td>
<td>- .04</td>
<td>.43***</td>
<td>.61***</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PC</td>
<td>1</td>
<td>.49***</td>
<td>.72***</td>
<td>.34**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE</td>
<td>1</td>
<td>.54***</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>1</td>
<td>.52***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PI</td>
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</table>

Note: SoA = Sense of agency; SoC = Sense of community; SP = Social presence; PH = Perceived helpfulness; PJ = Perceived enjoyment; PE = Perceived evaluation; PC = Perceived competence; PA = Posting attitude; PI = Posting intention; ‘p < .10, *p < .05, **p < .01, ***p < .001.

Effects of Time on Outcome Variables

Whereas the results for the first set of the hypotheses are based on participants’ perceptions reported right after Session 1, additional analyses using the data from Session 2 and differences between the two sessions shed more light on the effects of the online buddy manipulation. Moreover, the effects of the online buddy should be considered as potentially interacting with bandwagon cues. No difference between the two online buddy conditions was found for perceived responsibility after Session 2 ($F_{(1, 85)} = 1.80, p = .18$). However, time was found to have a main effect on perceived responsibility ($F_{(1, 90)} = 4.87, p < .05$). Participants’ perceived responsibility increased over time as shown in Figure 3-2 (Session 1: 4.73; Session 2: 4.89).
There were also interaction effects between time and the online buddy on sense of community ($F_{(1, 90)} = 6.91, p < .05$), social presence ($F_{(1, 90)} = 4.28, p < .05$), or perceived evaluation ($F_{(1, 90)} = 5.07, p < .05$). For the non-buddy condition, participants’ sense of community, social presence, and perceived evaluation did not change much over time. Participants in the online buddy condition, on the other hand, reported decreased sense of community, social presence (see Figure 3-3), and perceived evaluation (Figure 3-4) over time. There was also a marginally significant interaction effect between time and the online buddy on posting attitude ($F_{(1, 90)} = 3.33, p = .07$). The results also show a decrease in posting attitude in the online buddy condition over time with no change in the non-buddy condition (Figure 3-4).
Figure 3-3: Interaction effects between time and the online buddy on sense of community (top) and social presence (bottom)
Mediation Analysis

The current study was particularly interested in the potential mediating effects of the aforementioned psychological motivation variables in the relationship between the two main
independent variables and the attitudinal and behavioral outcome variables (H7a and H7b). H9 also predicted mediation, specifically that perceived responsibility, perceived evaluation, and psychological reactance would mediate the potential negative effects of the independent variables on the dependent variables. Because the study model included two independent variables, one of which functions as a moderator, Hayes’ PROCESS macro in SPSS was used for the moderated mediation analysis using a bootstrapping method with 5000 samples and bias-corrected, 95% confidence intervals. A basic outline of the analysis is illustrated in Figure 3-6 (i.e., Model 8 in PROCESS) (Hayes, forthcoming). A series of these mediation analyses were performed to test the theoretical paths proposed in the study model with participants’ attitudinal and behavioral outcomes as dependent variables.

Figure 3-5: Moderated mediation model in PROCESS by Hayes (forthcoming)
The first set of mediation paths tested the relationships between the online buddy (X) and bandwagon cues (W) on posting attitude, posting intention, and website attitudes (Y, Y_2, Y_3) through one’s sense of agency and sense of community. The mediation tests revealed that sense of community mediated the effects of having an online buddy on website attitudes (b_1 = -.21, SE = .13, LLCI: -.56, ULCI: -.03), posting attitude (b_2 = -.20, SE = .11, LLCI: -.56, ULCI: -.04) and posting intention (b_3 = -.40, SE = .20, LLCI: -.93, ULCI: -.05) but only when the bandwagon cues were weak (Figure 3-6).
Summary of Findings

The online buddy assignment had negative effects on participants’ psychological reactions, such as social presence, sense of community, and posting intention in Session 2. The interaction effects between time and the online buddy on sense of community (Figure 3-3), social presence (Figure 3-3), posting attitude (Figure 3-4), and perceived evaluation (Figure 3-4) also confirmed the negative impact of the buddy assignment on one’s psychological reactions.

Participants' positive psychological experiences with the study website were possibly attenuated twice in the buddy assignment manipulation: 1) by user information (i.e., user name) provided via
questions suggested in My Page in Session 1 and 2) by thank-you messages from the buddies in Session 2.

However, strong bandwagon cues attenuated the negative effects of buddy assignment on participants’ perceived helpfulness and social presence, but they weakened their effects in the non-buddy condition by decreasing these outcome variables compared to those in the weak bandwagon cue condition (Figure 3-1). The value of bandwagon cues also resulted in differences in individuals’ attitudes about posting between the conditions such that strong bandwagon cues generated a greater level of intention to post than weak bandwagon cues, as evidenced by the main effect of the bandwagon cues.

Further repeated-measured ANOVAs found that participants’ perceived responsibility increased over time, while all other outcomes decreased. The study anticipated such decreases over time across all measured variables due to the experimental setting of Session 2, which may have distracted participants’ focus from the session. Despite the natural obstacles of participation, the increased perceived responsibility from Session 1 to Session 2 implies that participants felt responsible for their behaviors and performance in the study regardless of the presence or absence of the buddies. However, the presence of the online buddies led to decreases in sense of community, social presence, perceived evaluation, and posting attitude over time.

Lastly, the results of the mediation analysis showed that the presence of the online buddy led to decreased sense of community, which negatively mediated the relationship between the online buddy and participants’ attitudes about the website, posting attitudes, and posting intentions but only in the absence of strong bandwagon cues.
Chapter 4

Discussion

Although lurking behaviors are not an entirely detrimental issue in online communities (Preece & Shneiderman, 2009), they still pose subsequent problems related to under contribution (Fox & Jones, 2009). Such lurking tendencies are related to the size of the community and become inevitable as the community grows and attracts more members with a greater amount of resources. Thus, this dissertation aimed at developing an interface feature—an online buddy—that could encourage user participation and spur users’ motivation to participate in an online health community website. It also anticipated that the new feature’s effectiveness for user community participation would interact with bandwagon cues as a form of community feedback. This dissertation structured these two main expectations based on theoretical speculations of social impact theory (Latané, 1981) and social facilitation theory (Zajonc, 1965), along with previous studies suggesting positive effects of primary website features on various psychological outcomes. The study revealed unexpected findings, however. The following section unravels the puzzle and draws implications for theories about online sharing behaviors.

Conditional Negative Effects of Social Responsibility in an Online Health Community

The findings from the study had some contradictions with the theoretical predictions of SIT with regard to the role of social responsibility among individuals in terms of their group participatory attitudes and behaviors. When participants realized they had to take care of particular users (identified by user name), they exhibited weaker feelings of belonging to the community and being connected with others in the community and, therefore, anticipated posting
fewer future responses in this community. This tendency among users in the online buddy condition, who were encouraged to engage with particular members of the community, became stronger when they logged into the community website for a second time. The results showed an effect for social responsibility in the opposite direction to what was anticipated. According to SIT, social loafing tendencies should diminish as the level of social responsibility increases (Latané, 1981). If that is the case, why are there inconsistencies between theory and the findings from the current study?

**Conceptual conflict between the online buddy and the online community**

The buddy assignment itself may have undermined the original definition of an online community and altered the meaning of it among participants. It probably served to reduce the community’s boundary and made it feel smaller with a limited scope. This strategy of limiting group size for interactions has appeared to be effective in previous studies for group brainstorming and collaborative work settings (Kraut, 2003; Valacich, Dennis, & Nunamaker, 1992). However, when it goes against users’ conceptualizations of online communities by narrowing the scope of user interaction, the buddy assignment might not function in the same way that SIT predicts. Users who had a particular number of people requesting their help via the online buddy list showed negative psychological reactions compared to those who accessed the same community questions in My Page without any buddy cue.

This contradictory finding to SIT raises a major theoretical question with regard to the goal of social responsibility. The body of literature examining the predictions of SIT suggests that the aggregated group’s performance is important to the group’s goal rather than the goals of separate individuals (Moreland, Levine, & Wingert, 1996). The user information in the buddy assignment condition was framed to make it seem like particular members would benefit from
participants’ help as opposed to the entire community benefiting. This baseline of activating social responsibility among a large community must be taken into account for its positive effects. Thus, the online buddy system may only have positive outcomes it yielded both a high level of group bonding and a high level of group identity instead of attachment to particular individuals in the community (Farzan, Dabbish, Kraut, & Postmes, 2011; Ren, Kraut, & Kiesler, 2007).

This issue specifically points to the conceptual conflict between the influence of perceived social responsibility and individuals’ expectations for exclusive goods compared to public goods. The meaning of social responsibility is likely to be more salient when it comes to creating public goods rather than exclusive goods. Therefore, an explicit means of creating exclusive goods for certain users in the community that is triggered by the online buddy cue may be incompatible with users’ original perceptions of the meaning of public goods in an online community. Instead, the information and support participants offer need to be available to the entire community for free rather than exclusively offered to specific people who signed up to be recipient buddies.

Is it social responsibility or personal responsibility?

Most of the research conducted within the SIT framework has examined the effects of social responsibility within group work that stresses achieving the goals of the group as a whole. However, it may be the case that participants helped buddies in the study website out of a sense of personal responsibility rather than social responsibility. Participants may have offered help to their buddies because they received a specific request from the website or perhaps perceived such a request as a task expected of them to complete the study. Therefore, it is plausible that the two types of responsibility elicit different action tendencies such that personal responsibility orients users toward task completion, whereas social responsibility makes users’ roles and obligations
salient in the process of achieving the group’s goal. In this sense, the online buddy cue triggered a
sense of personal responsibility to urge particular individuals to complete the task rather than
evoke a societal level of responsibility to enhance the community.

The overall increase in perceived responsibility from Session 1 to Session 2 might
corroborate the existence of two different types of user responsibility (Figure 3-2). When
perceived responsibility was assessed in Sessions 1 and 2, participants were more likely to report
that they performed well in the community website and that the task they were given was
important. Therefore, regardless of the presence or absence of the online buddy cue, participants’
feelings of personal responsibility increased over time due to the study situation. As such, the
artificial environment of the online community could be attributed to the low amount of social
responsibility perceived from the beginning. Users may not have felt a complete sense of
community during their participation in the study. Therefore, they may have focused instead on
completing the task given in the study, thereby increasing their feelings of personal responsibility.
In addition, the difference in the degree of sense of community among participants found between
the non-buddy and online buddy conditions is evidence that participants interpreted the study
community in different ways—either as a natural online community website or as an artificial
online community website.

Critical role of sense of community in social responsibility

The conditional mediation effects of the online buddy and bandwagon cues may indicate
a theoretical mechanism explaining the importance of the online community concept (Figure 3-7),
especially in the absence of bandwagon cues. The absence of strong bandwagon cues led
participants in the online buddy condition to perceive a weaker sense of community and, in turn,
report less positive attitudes and behavioral outcomes toward posting activity. In other words,
when participants did not receive a great deal of feedback, they exhibited a lack of sense of community and fewer positive attitudes. This mediation effect of sense of community did not matter much when bandwagon cues were strong because strong bandwagon cues themselves represented community feedback and provided participants a sufficient level of sense of community. Previous studies have already demonstrated there is a strong relationship between bandwagon cues and sense of community, which, in turn, leads to positive user attitudes (Kim & Sundar, 2011; Stravositu & Sundar, 2008). Thus, it is critical for online communities to maintain the original concept of the online community by supplying a sufficient level of community feedback to enhance the level of social responsibility using the online buddy cue. Doing so would optimize both psychological feelings of belongingness to the community and attitudinal and behavioral outcomes, such as posting attitude and posting intention, provided—of course—that users receive positive, rather than negative, feedback on their posts.

User invisibility principle in online communities

In addition to undermining the social responsibility effect resulting from the conceptual incompatibility between the online buddy cue and online community, another conceptual discrepancy could emerge from the online buddy assignment and the mental picture of the online community among users—namely, violation of anonymity. One common expectation within online communities is that users are anonymous. Although the user names in the study were anonymous, they may have made participants question if the website specifically identified users to provide them as buddies. Therefore, participants may have felt this identification process broke the community’s anonymity rule. As such, user invisibility might be necessary to activate the positive effects of social responsibility within the community (Finholt & Sproull, 1990). Specifically, when participants read the thank-you messages from buddies who had received their
help during the second interaction, they may have felt somewhat exposed even if only to their grateful buddies regardless of whether they had intended or desired to identify themselves to anyone in the community.

**Cue Accumulation Effects between the Online Buddy and Bandwagon Cues**

As discussed previously, the positive effect of social responsibility may only be effective when users experience sufficient feelings of community. In addition, the effects of social responsibility can be amplified when users perceive significant benefits in comparison to the amount of effort they put into the community. Butler’s (2001) investigation of the dynamic nature of the relationship between group size and user cost/benefit in online communities indicated that the community could sustain a greater number of members when members received more benefits than costs. Thus, when placed in a situation in which they had just created a user account and visited the study website for the first time, participants may have believed there would be no time for them to benefit from the site at all. Generally, when individuals set a goal of joining an online health community, they tend to expect their needs to be met and saturated at an optimal level in the community (Cutrona, 1990). Although reciprocal actions can be vital to the sustainability of the community, such actions would not become visible until users have themselves benefited from the community.

The study also showed that negative effects of online buddy assignment might be alleviated by the principle of reciprocity (Gouldner, 1960; Kollock, 1999; Krishnan & Carment, 1979). Most of the time, however, this reciprocity principle can be applied as a take-and-give rather than a give-and-take rule among users. This tendency in helping behaviors has been confirmed in previous studies such that when users receive help prior to helping, they tend to exhibit a greater degree of helping behavior than when they do not receive prior help (e.g.,
Berkowitz & Daniels, 1974). Therefore, without having any prior benefits in this particular online community, when participants felt a lack of anonymity on the site, they may have ignored the positive effect of the buddy assignment. On the other hand, when the participants received good community feedback via strong bandwagon cues, such negative effects of the online buddy assignment may have diminished (Figure 3-1). In this case, the participants may have perceived the community feedback as a type of psychological benefit from the community.

The interaction effects between the online buddy and bandwagon cues demonstrated a compensating effect for bandwagon cues as community feedback. Bandwagon cues triggered the presence of others and community vitality among users. Therefore, positive psychological reactions among users who had buddies and received strong bandwagon cues helped users eventually overcome the conceptual discrepancy caused by the buddy assignment in the community context, which led them to be pleased by good community feedback. However, participants who helped buddies but did not receive good community feedback in the weak bandwagon cue condition showed consistently negative psychological reactions in Session 2 as well.

On the other hand, those who were less cued by the online buddy assignment with regard to interaction exclusivity on the community website showed different reactions when they received a fairly high level of community feedback within a very short time after posting in Session 1. These participants in the non-buddy condition became sensitive to the community environment in the study website throughout the study. Then, participants may have detected the sudden attention from others in the community and grown suspicious, leading them to more carefully scrutinize the community feedback. In this case, strong bandwagon cues would not do much to boost users’ perceptions but would instead serve to decrease participants' positive psychological experiences with the website in the non-buddy condition due to users’ suspicion about the credibility of the community feedback they received when the strong and positive
feedback was generated in a relatively very short period of time. Such suspicion may not have
developed in the weak bandwagon cue condition because users may have believed the amount of
time between their posting activity and receiving feedback was reasonable (Figure 3-1).

**Flattery effects vs. probing effects**

Positive and negative effects of the bandwagon cues among participants in the online
buddy and non-buddy conditions likely opened the door for the bandwagon cues to exert
powerful effects resulting from heuristic processing in the context of online sharing. Sundar
(2008a) suggests that bandwagon cues prompt users to process information by enabling them to
make instant judgments based on available and relevant heuristics. In fact, the bandwagon cues
used in this study probably triggered bandwagon heuristics related to the popularity of the content
the participants produced as a form of community feedback. However, different bandwagon cue
values—positive (i.e., strong) or negative (i.e., weak)—probably activated different cognitive
routes for processing those cues among users depending on the presence or absence of the online
buddy cue. As explained earlier, compared to weak bandwagon cues, strong bandwagon cues
were seen as validation of participants’ helping behavior by the community when the online
buddy cue was present. Thus, this endorsement process may have made participants feel flattered,
thereby compensating for the negative psychological feelings produced by the conceptual
discrepancy experienced in Session 1.

On the other hand, the value of the strong bandwagon cues in the absence of the online
buddy cue prompted users to engage in a cue-evaluation process to assess the credibility of the
cues. This accuracy motivation is well known as a means of reinforcing message elaboration
(Eagly & Chaiken, 1993; Forehand, Gastil, & Smith, 2004). In particular, research has shown that
accuracy motivation evokes probing effects. Specifically, as the level of motivation to be accurate
in terms of source and information increases, individuals demonstrate greater suspicion in regard to the “veracity of information presented” (p. 473, Levine & McCorinack, 2001). In general, such probing would have resulted in more negative attitudes making the behaviors suggested by the information source seem less acceptable unless a probing heuristic (i.e., when a source and information is well scrutinized, it must be credible and trustworthy) was elicited, as would be the case if the level of confidence with the source and information was sufficient. In this dissertation study, participants tended to show a low confidence level because they were not familiar with the online community website. Lacking previous interaction with the community probably led participants to systematically probe the bandwagon cues as information due to lower confidence with the source—that is, the online community.

The elaboration likelihood model (Petty & Cacioppo, 1986) also confirms two cognitive routes for processing bandwagon cues in the two different situations characterized by the presence or absence of online buddies. ELM generally predicts that 1) peripheral cues, such as bandwagon cues, will generate more favorable or unfavorable attitudes depending on the valence of the message regardless of the argument’s quality; 2) strong arguments will generate more positive attitudes toward a persuasive message than weak arguments when individuals are highly involved in message processing; 3) a larger number of strong arguments will generate more favorable user attitudes toward the message whereas a larger number of weak arguments will generate more unfavorable user attitudes toward the message; and 4) strong arguments are superior to weak arguments in producing corresponding attitudes toward messages when peripheral cues are absent (Eagly & Chaiken, 1993, p. 312; Wood, Kallgren, & Preisler, 1985). Therefore, participants who perceived bandwagon cues as peripheral cues showed favorable or unfavorable attitudes depending on the valence of the cues (i.e., strong vs. weak), which is consistent with ELM prediction 1. However, when participants in the non-buddy condition centrally processed the bandwagon cues by viewing the cues as arguments, they may have
noticed that the ten replies were all very short agreement-style arguments without much information (i.e., weak arguments). This cognitive processing of bandwagon cues is unique because participants generally perceive community feedback positively when the volume of the feedback is high. In fact, participants reported the quantity of replies and star rating to be more credible (i.e., whether the number of replies and star ratings of helpfulness was appropriate, acceptable, expected, reasonable, and believable; $F_{\text{replies}} (1, 90) = 39.7, p < .001; F_{\text{star ratings}} (1, 90) = 9.16, p < .01$) in the strong bandwagon cue condition ($M_{\text{replies}} = 6.79, SD = .23; M_{\text{star ratings}} = 6.69, SD = .21$) than in the weak bandwagon cues condition ($M_{\text{replies}} = 4.69, SE = .23; M_{\text{star ratings}} = 5.76, SD = .21$), regardless of the presence of online buddies. However, the participants who paid attention and scrutinized the feedback may have been disappointed by the actual quality of the replies because of the repetitive information carried by the ten agreement-style replies, thereby eliciting fewer positive attitudes in the strong bandwagon cue condition than in the weak bandwagon cue condition, which included only two core replies (i.e., ELM predictions 2, 3, and 4). These findings showed that participants discriminate between quantity and quality of community feedback in the absence of peripheral interface cues such as online buddies. While they still would like to believe that many other users paid attention to what they did in the community (evidenced by their trust in the number of replies and star ratings), they also scrutinize the content of this feedback more because of the accuracy motivation (Figure 3-1). This two-step processing of the cues in the context of online sharing is consistent with the theoretical propositions of ELM.

**Importance of Bandwagon Cue Valence in Social Facilitation**

SFT (Zajonc, 1965) and other research using SFT theoretical frameworks argue that the mere presence of others can amplify the effects of feelings of social responsibility (Rafaeli &
However, the current study found that users might not solely rely on the recognition of other community members’ presence when considering whether to act upon the social responsibility given to them. It should be noted that the operationalization of community feedback as a cue of other members’ presence used in previous studies (Arguello et al., 2006; Rafaeli & Noy, 2002) is not identical to that used in the current study, which considered bandwagon cues as a form of community feedback. Importantly, the bandwagon cues in this study indicated not only the volume of community feedback (i.e., how many other users paid attention to/recognized a user’s posting activity in this community) but also the valence of feedback in the form of the numbers of replies on and the stars ratings of helpfulness for participants’ comments (i.e., how good a user’s posting was in the community). In this sense, the main effect of the bandwagon cues on posting intention demonstrated the influence of the community feedback—rather than simply the sheer amount of it—and, in particular, the significance of the feedback’s positive or negative valence. The bandwagon cues’ valence became critical when the cues were presented with or without the online buddy cue, as addressed in the earlier section describing the interaction effects between the online buddy and bandwagon cues. Therefore, the current study’s findings suggest that theoretical expectations based on SFT need to be precise as to what is meant by the presence of the others. Further, cues’ valence is more central to social facilitation resulting from feelings of social responsibility than the mere existence of cues indicating the presence of others.

**Practical Implications**

Based on the findings and theoretical explanations discussed thus far, this dissertation offers several recommendations and directions for online community designers in the health communication domain.
**Question-filtering system**

The way the study website presented a short list of questions from the community resulted in positive psychological outcomes. There is room for debate as to whether this study specifically compared the effectiveness of this particular function. However, a case could be made that the function was examined to some extent because the feature was an integral part of the online and non-buddy conditions. The main effect of time on perceived responsibility (Session 1 < Session 2) is evidence of the effectiveness of this design suggestion. Therefore, this website feature offers promise with regard to users feeling responsible for participation.

This particular feature in the user account page answers one of the questions regarding individuals’ motivations for lurking in online communities. An unsatisfactory level of knowledge about an online community prompts users to avoid active engagement and community participation (Nonnecke et al., 2004). Therefore, automatic suggestions for browsing topics based on users’ interests, especially when presented on the most relevant page for users (i.e., My Page), may be a tangible solution for alleviating under contribution. This question-filtering system shows users the scope of the community at a micro level rather than overwhelming them with a huge amount of information at the macro level. That is, this approach provides users with a digestible amount of inquiries and help requests from community members that are tailored to the users specifically. Research has consistently suggested that interface designs demanding a high cognitive load have negative effects (Oviatt, Coulston, & Lunsford, 2004; Sundar, Oh, Bellur, Jia, & Kim, 2012). Therefore, an interface feature that can reduce such cognitive demands by filtering out suitable questions that online community users can answer would be useful. In other words, such a new route to access an online community directly through a user account page may increase perceived responsibility toward the community over time. This particular community
interface feature can allow newcomers to easily adapt to the community environment by reducing or even eliminating a difficult learning phase of community membership.

**Emphasizing universal benefits for community users, not just for buddies**

Although the question-filtering system in the user account page has potential, it needs to be implemented carefully when applied with an online buddy system. One of the major findings from the current study is the importance of a proper conceptual connection between the function of the online buddy cue and users’ understanding of online communities as a public space for everyone. Therefore, when an online community interface emphasizes interactions between users and online buddies, it may elicit negative results because of the exclusivity triggered by the online buddy cue. Thus, it is critical for interface designers to create a natural environment that can prevent such conceptual discrepancies between the online buddy cue and the original concept of online communities for the production of public goods. One way to realize this goal is to not only introduce online buddies through the user account page but to also inform users of the importance of their help in terms of benefitting the overall community and providing helpful information and support for other users as well.

**Clarifying the cue-award system**

Additionally, the findings from the current study also indicated an interaction between the online buddy and bandwagon cues. In other words, the sole presence of the online buddy cue may not guarantee positive effects to promote user contribution. The online buddy cue required positive community feedback to improve users’ attitudes and intentions to contribute. Therefore, designers must implement a bandwagon cue metric system when they adapt the online buddy idea
for user contribution in online communities. However, one easy mistake that online community
designers might make is to not explicitly provide information about the processes determining
member status and providing community feedback. Designers may assume that users already
know about the general rules of most communities and how each online community has several
membership statuses depending on users’ membership history and/or activity log in the
community. However, this might be an overly generalized assumption when applied to most
people. For example, Epinions.com provides specific information about its award system by
including a metric that assesses user popularity and authority level within the community. Such
clarification cues should help users reduce the time they spend exploring, evaluating, and
validating information and its source in the community. Furthermore, the negative effects of
strong bandwagon cues on users’ psychological state in the non-buddy condition could
corroborate the idea of transparency and appropriateness of a cue-award system. Strong, positive
community feedback no matter how users participate in the community would not be helpful in
forming users’ positive psychological states.

**Limitations and Future Research**

The study lacked external validity in that the students did not choose to interact with the
study website; therefore, they may have had low involvement with the site as well as difficulty
developing a sense of community over the two-week period of the study. However, external
validity might not be highly influential to this kind of an online health community among a
college student population because participants’ prior experience with online health communities
was generally weak. However, users’ willingness to choose online communities must be taken
into account for this type of research in the future.
The study could have also investigated individual user preferences and characteristics besides the individual difference variables controlled for in the current study. Some users seek out online communities for support and helpful information because they do not want to ask for such help in interpersonal face-to-face interactions. This type of user could have different psychological states from what participants in this study showed. On the other hand, online buddies could generate strong positive psychological effects for users who prefer to develop strong relationships with others in online communities as they do in real life. Users’ ability to answer the question their buddy asked could also be another individual difference variable worth further consideration. Individuals’ fears of accountability and legal repercussions, such as lawsuits, could have also played a role in their willingness to contribute to the online community. In particular, one potential ethical issue surrounding online buddy systems in peer-to-peer health communication requires the attention of researchers and designers. Specifically, one common issue that online community users might overlook involves the potential consequences of inaccurate information when giving and/or receiving support from the community (Kortum, Edwards, & Richards-Kortum, 2008). Potential misinformation can cause a great deal of problems, especially for someone who uses the misinformation to solve their health problems (Rice, 2006). Despite often knowing of the potential harm caused by misinformation, online community users tend to trust the information as a result of the strength of the relationships they build with other users in the community (Wang, Walther, Pingree, & Hawkins, 2008). Therefore, online health communities are strongly advised to incorporate appropriate functions for monitoring the information and support community users exchange.

It is also worthwhile to state further ideas for future research. From a communication ethics perspective, the negative effects of the current design, which included the online buddy, may raise questions about user privacy. For instance, a user might ask, “Do I really want a buddy in this community?” Communicating health information, especially with peers, sometimes
generates apprehension about revealing too much information about oneself (Whiddett, Hunter, Engelbrecht, & Handy, 2006). However, people sometimes expedite their self-expression when they feel they are communicating with others who share similarities as long as their privacy is secured through disguised identities (Bargh, Fitzsimons, & McKenna, 2003).

Under the generally accepted assumption that participants in an online community share common interests (Ridings, Gefen, & Arinze, 2002), questions about users’ own decisions about the need for online buddies should be probed further by testing various modifications to the online buddy system. Following the theoretical guidance of optimal matching theory (OMT) (Cutrona, 1990), it might be useful to provide users with the option to choose whether they would like the buddy-assignment feature. This would take into account users’ own need and preferences for initiating interactions with others in an online community. Du’s (2005) inspiration for the online buddy idea originated from a solution to lurking. Du suggested online buddy systems would give online community users the opportunity to like other users. In this sense, including an online buddy system is expected to have positive psychological, attitudinal, and behavioral outcomes.

In addition, the health topic on which this dissertation was focused does not represent the dynamics of online health communities at large, and the sample population was limited. Acute, chronic, life-long, serious, and even stigmatized diseases (e.g., HIV) may create a great deal of variation in the effects of online buddies. In fact, these types of medical conditions are highly related to one’s involvement with online sharing activities. Patients with chronic diseases, such as cancer or diabetes, are more likely to participate in online communities than those who simply seek information about treatable diseases (Thrasher, Campbell, & Oates, 2004). In particular, this type of personal involvement variable has been studied as a significant moderating variable in research based on dual-processing models. The disease variable is also related to the distinction between the five needs (i.e., emotional needs, social integration or networking, needs for esteem,
tangible aids, and information needs) that OMT specifies (Cutrona, 1990, p. 7). Therefore, future programmatic research should be geared toward forming a bigger picture of the effects of online buddy systems.

With regard to the helping behaviors emphasized in this study, compassion fatigue may disrupt the positive effects of social responsibility in online health communities. Compassion fatigue is “a state of tension and preoccupation with the traumatized patients by re-experiencing the traumatic events, avoidance/numbering of reminders persistent arousal (e.g., anxiety) associated with the patient” (Figley, 2002, p. 1435). Although the current study does not specifically address “traumatic events” as a major health theme, online community users may choose to avoid repetitive requests from their buddies when such requests burden their voluntary actions. Therefore, future research may examine the relationships between the number of requests made by buddies, the intensity of the requests made, the degree of social responsibility users perceive, and the subsequent attitudinal and behavioral outcomes in an online social support context.

Lastly, this dissertation includes limitations associated with cross-sectional designs and ethnicity composition. It attempted to incorporate two consecutive sessions and combined lab experiment methods and a field experiment setting. However, it is still necessary for further research to be executed in a live online health community environment to maximize external validity. Authenticity must be accounted for in research related to this study in the future. Moreover, although the current study obtained some variation in participant race (68% white; 12% Asian; 9% of Hispanic; 7% black; and 4% others), future research should explore whether race has strong interaction effects with online buddy and bandwagon cues on online sharing. Research on cultural differences has suggested differences between Eastern and Western cultures in terms of initiating and interpreting interpersonal relationships (Hofstede, 2001). Future
research can complement this study by exploring commonalities and dissimilarities between offline and online interpersonal relationships with regard to cultural influences.

**Conclusion**

This dissertation study aimed to make theoretical contributions to research on online sharing as well as to offer practical implications for designers of online community websites. The exploratory idea of the online buddy system was developed from a strong social psychology basis—namely, the dilution of social responsibility (Latané, 1981). This research discovered limited effects of social responsibility in the context of online sharing when particular community users were assigned as buddies while communicating health information. The primary theoretical assumption of social responsibility is that people will become alert and willing to help when particular help requests are given in a public space. However, such an assumption may not be compatible with the core concept of online buddies because online buddies trigger users’ immediate focus on a small number of individual users rather than on the overall community as a whole.

Furthermore, the study revealed a cue compensation effect in online sharing context. As ELM predicted (Petty & Cacioppo, 1986), when cues are presented in an accumulated fashion, they lead users to engage in different forms of information processing. The current study showed that positive bandwagon cues gave users psychological relief when they invested a lot of effort in helping buddies. However, negative bandwagon cues harmed users’ expectations toward their investment. Strong bandwagon cues enhanced users’ accuracy motivations when they were not presented with the online buddy cue. Therefore, users viewed the cues as information, and they evaluated whether that information was credible given this study’s particular timeframe (i.e., it
only took a few days for bandwagon cues to appear). This probing effect was not prompted in the weak bandwagon cue condition.

The current study aimed at developing a tangible theory-driven solution for under-contribution issues in online communities and testing the effects of that solution. Along with several practical implications, this study proposes effective problem-solving approaches for this research field. In addition, the current study’s findings can be applied to other online sharing domains in addition to health communication, including educational and organizational communications, because its theoretical foundations were created using a broad array of social psychology research. Moreover, the study demonstrated the potential of the online buddy system and bandwagon cues in online community interfaces, particularly for newcomers as it was designed to study new community member. Krishnan and Carment (1979) specifically highlighted the importance of forming positivity among newcomers through the psychological benefits of a community because such positivity is a significant factor influencing whether newcomers will continue participation or remain lurkers.

Despite arguments surrounding the inevitability or triviality of lurking in relation to online community sustainability (e.g., Bishop, 2007; Jones, Ravid, & Rafaeli, 2004; Shiue, Chiu, & Chang, 2010), an online community’s vitality depends on the richness and diversity of the information and support the community provides its users. This ideal of online communities can be fulfilled by having a large number of users who share a wide range of perspectives and experiences via discussions on various topics. The findings from this experiment, as well as the directions suggested for future research regarding the implementation of innovative interface features, add to our knowledge about promoting user participation and encouraging online sharing of helpful information.
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Please note that this website has a unique feature that introduces you potential friends with whom you can provide help. The website will generate a list of your potential online buddies in My Page based on the information about diet and nutrition that you submit when you create a user account of the site. Remember, your buddies are waiting for your help!
Appendix B
Questionnaire Items

Posting Attitudes
My posting on this message board would be...
(Describes Very Poorly = 1; Describes Very Well = 9)

Good, Beneficial, Pleasant, Wise, Enjoyable, Necessary

Please select a number on the scale that best describes your opinion on each of the following statements. (Extremely Unlikely = 1; Extremely Likely = 9)

I intend to post a message (i.e., question or reply) again on this message board.
I will try to post a message (i.e., question, reply, comment) on other message boards.
I will plan to post a message (i.e., question, reply, comment) on community websites in general.

Website Attitudes
(General website attitude; Lin, 2007)
Please select a number on each scale that best represents how you feel about THE WEBSITE you visited. (Strongly Disagree = 1; Strongly Agree = 9)

The website has personal meaning to me.
I like using this website.

(Website Attitudes; Kalyanaraman & Sundar, 2006)
Please select a number on each scale that best describes THE WEBSITE you visited. (Describes Very Poorly = 1; Describes Very Well = 9)
Appealing, Useful, Positive, Good, Favorable, Attractive, Exciting, Pleasant, Likable, High quality, Interesting, Entertaining, Stimulating

Perceived Responsibility (Hackman & Oldham, 1974)
Please select the number that best reflects your opinion for each statement below on the scale. (Very Inaccurate = 1; Very Accurate = 9)

The site gave me considerable opportunity for independence and freedom to how I took actions. The site itself was not very significant in the broader scheme of things. (Reversed-coded) It’s hard, on this site, for me to care very much about whether or not the activities get done right. (Reversed-coded)
My opinion of myself goes up when I use this site well. Most of the things I have to do on this site seemed trivial. (Reversed-coded) The work I do on this site is very meaningful to me.
I feel a very high degree of personal responsibility for the work I do on this site. I feel bad and unhappy when I discover that I have performed poorly on this site. I feel I should personally take the credit for the results of my work on this site. I feel I should personally take the blame for the results of my work on this site.
Generally, my own feelings are not affected much one way or the other by how well I do on this site. (Reversed-coded)
Whether or not the work on this site gets done right is clearly my responsibility.

**Perceived Evaluation** (Hall & Henningsen, 2008)
Please select a number on the scale that best describes your opinion on each of the following statements. (Strongly Disagree = 1; Strongly Agree = 9)

I felt like my performance was being evaluated.
I noticed the presence of other people on the message board.
My activity on the message board was being observed.
The presence of others on the message board was not obvious to me. (Reversed-coded)
While on the message board, I was being evaluated.
The presence of the others was not known to me. (Reversed-coded)
I was aware of the presence of others.

**Social Presence** (Gefen & Straub, 2003)
Please select a number on the scale that best describes your opinion on each of the following statements. (Extremely Unlikely = 1; Extremely Likely = 9)

There is a sense of human contact on the site.
There is a sense of personalness on the site.
There is a sense of sociability on the site.
There is a sense of human warmth on the site.
There is a sense of human sensitivity on the site.

**Psychological Reactance** (Hong & Faelda, 1996)
Please select the number that best reflects your opinion about each statement below on the scale. (Not At All = 0; Exactly = 8)

This online community triggered a sense of resistance in me.
When this online community forced me to do something, I felt like doing the opposite.
I considered advice from others and the online community to be an intrusion.
Advice and recommendations made me do just the opposite.

**Perceived Helpfulness** (van Uden-Kraan et al., 2008)
In this online support group, how likely do you think it would be for...
(Very Unlikely = 1; Very Likely = 9)

someone to ask for your help or advice?
you to be an example to other participants?
you to offer advice and support to others?

**Perceived Competence**
Please respond to each of the following items in terms of how true it is for you with respect to your posting on the message board using the scale below. 
(Not At All = 1; Exactly = 9)

I feel confident in my ability to post a message on the board.
I am capable of posting a message on the board.
I am able to achieve my goals on this message board.
I feel able to meet the challenge of performing well in this message board.
I am satisfied with my performance at this posting activity.
This was an activity that I couldn’t do very well. (Reversed-coded)

Perceived Enjoyment
Thinking of sharing information online (i.e., posting a question, reading replies, etc.) on the website you visited today, please select the number that best describes the reason why you were engaged in the activity of sharing information on this website. Answer each item according to the following scale. (Not at all = 0, Exactly = 8)

because I thought that this activity was interesting.
because I did it for my own good.
because I was supposed to do it. (Reversed-coded)
There might be good reasons to do this activity, but personally I didn’t see any. (Reversed-coded)
because I thought that this activity was pleasant.
because I thought that this activity was good for me.
because it was something that I had to do. (Reversed-coded)
I did this activity but I was not sure if it was worthy. (Reversed-coded)
because this activity was fun.
because it was a personal decision.
I didn’t see what this activity would bring me. (Reversed-coded)
because I felt good when doing this activity.
because I believed that this activity was important for me.
because I felt that I had to do it. (Reversed-coded)
I did this activity but I am not sure it was a good thing to pursue. (Reversed-coded)

You’ve thought about the activity of commenting on the message board. With this in mind, please imagine what types of outcomes these activities (that is, posting or replying) might have for you. Then, indicate the degree to which each of the following statements describes the outcomes of your posting / replying activity. (Kim & Sundar, 2011; Stavrositu & Sundar, forthcoming) 
(Strongly Disagree = 1; Strongly Agree = 9)

Sense of Agency
I have control over my own voice.
I assert myself.
I have a distinct voice.

Sense of Community
I feel at home in this message board.
I care about what readers think of my views and actions.
It may well become very important to me to interact with others through this message board.
People posting and replying to this message board will not get along with each other. (Reversed-coded)
I expect to interact a lot with others through this message board.
I expect to receive support from other users on the message board.
I expect that some of the users of this message board will be friends with each other.
I expect to have friends among those who are users of this community website.
I expect that some users in this community website can be counted on to help others.
I might feel obligated to help others through this message board.
I think I will like users on this message board.
I feel other users on this message board will mean a lot to me.

Social Desirability Scale-17 (SDS-17) (Stöber, 2001)
Below you will find a list of statements. Please read each statement carefully and decide if that statement describes you very well (9) or poorly (1). Please note that your answers will be absolutely confidential and anonymous.

I sometimes litter. (Reversed-coded)
I always admit my mistakes openly and face the potential negative consequences.
In traffic I am always polite and considerate of others.
I always accept others’ opinions, even when they don’t agree with my own.
I take out my bad moods on others now and then. (Reversed-coded)
There has been an occasion when I took advantage of someone else. (Reversed-coded)
In conversations I always listen attentively and let others finish their sentences.
I never hesitate to help someone in case of emergency.
When I have made a promise, I keep it – no ifs, ands or buts.
I occasionally speak badly of others behind their back. (Reversed-coded)
I would never lie off other people.
I always stay friendly and courteous with other people, even when I am stressed out.
There has been at least one occasion when I failed to return an item that I borrowed. (Reversed-coded)
I always eat a healthy diet.
Sometimes I only help because I expect something in return. (Reversed-coded)

Social Responsibility Scale (Berkowitz & Daniels, 1964)
Click the number that conforms to the frequency with which you have carried out the following acts. (Never = 0; Very Often = 8)

I have helped push a stranger's car out of the snow.
I have given directions to a stranger.
I have made change for a stranger.
I have given money to a charity.
I have given money to a stranger who needed it (or asked me for it).
I have donated goods or clothes to a charity.
I have done volunteer work for a charity.
I have donated blood.
I have helped carry a stranger's belongings (books, parcels, etc.).
I have delayed an elevator and held the door open for a stranger.
I have allowed someone to go ahead of me in a lineup (at Xerox machine, in the supermarket, etc.).
I have given a stranger a lift in my car.
I have pointed out a clerk's error (in a bank, at the supermarket) in undercharging me for an item.
I have let a neighbor whom I didn't know too well borrow an item of some value to me (e.g., a dish, tools, etc.).
I have bought 'charity' Christmas cards deliberately because I knew it was a good cause.
I have helped a classmate who I did not know very well with a homework assignment when I had greater knowledge of the subject.
I have voluntarily looked after a neighbor's pets or children without being paid for it before being asked.
I have offered to help a handicapped or elderly stranger across a street.
I have offered my seat on a bus or train to a stranger who was standing.
I have helped an acquaintance to move households.

Altruism Scale (Rushton, Chrisjohn, & Fekken, 1981)
Please click the number that best reflects your thoughts on the following statements.
(Strongly Disagree = 1; Strongly Agree = 9)

It is always important to finish anything that I have started.
In school, my behavior has gotten me into trouble.
When I work on a committee, I usually let other people do most of the planning.
I am the kind of person that people can count on.
Why should I bother to vote when I can do so little with just one vote?
Letting your friends down is not so bad because you can't do good things all the time for everybody.
It is more important to work for the good of the team than to work for your own good.
I would never let a friend down when he expects something of me.
Every person should give some of his (her) time for the good of his (her) town or city.
Important things should be done before enjoyable things.
I usually volunteer for special projects at school.

Other-directedness Scale (Brigg, Cheek, & Buss, 1980)
Please click the number that best reflects your thoughts on the following statements.
(Strongly Disagree = 1; Strongly Agree = 9)

In different situations and with different people, I often act like a very different person.
In order to get along and be liked, I tend to be what people expect me to be rather than anything else.
I am not always the person I appear to be.
I put on a show to impress or entertain people.
Even if I am not enjoying myself, I often pretend to be having a good time.
I may deceive people by being friendly when I really dislike them.
I would not change my opinions (or the way I do things) in order to please someone else or win their favor.
I feel a bit awkward in company and do not show up quite as well as I should.
When I am unsure how to act in social situations, I look to the behavior of others for cues.
My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.
At parties and social gatherings, I do not attempt to do or say things that others will like.

Task Involvement (Kalyanaraman & Sundar, 2006)
Please select a number on each scale that best represents how much you agree or disagree with the following statements about THE WEBSITE you visited. Please read each statement carefully and try to respond to all of them. (Strongly Disagree = 1; Strongly Agree = 9)

I found myself responding to this website.
I was involved with the content on this website.
I was emotionally involved in this website.
I paid attention to the website.
I read the thread carefully.
I made efforts to posting a question on the message board.
I was attentive to what I was doing with the website.
I was confused about what I was doing with the website. (Reversed-coded)
I was interested in activities on the website.
I was comfortable with activities on the website.
I felt happy while doing activities on the website.

**Topic Involvement** (Zaichkowsky, 1985)
Please select the number that indicates how well each of the following adjectives describes your feelings towards the topic of DIET and NUTRITION.
(Describes Very Poorly = 1; Describes Very Well = 9)

Important, Of concern to me, Relevant, Means a lot to me, Valuable, Necessary, Interested, Significant, Substantial, Interesting, Essential, Involving
VITA (for Ph.D. only)

Hyang-Sook Kim

EDUCATION

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<td>Ph.D. in Mass Communications</td>
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<td>8/2005-5/2007</td>
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SELECTED PUBLICATIONS (Recent)


WORK EXPERIENCE

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<td>Instructor (Mass Communication Research, Research Methods in Advertising &amp; Public Relations) at Penn State University</td>
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<tr>
<td>8/2006-5/2007</td>
<td>Lab Instructor (Mass Communication Research) at Kansas State University</td>
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<tr>
<td>6/2004-6/2005</td>
<td>Instructor (Test of English as a Foreign Language) in Seoul Language Institute, Seoul, Korea</td>
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<tr>
<td>1/2003-9/2003</td>
<td>Staff (Marketing and PR Management) in Purun 1318 Inc. (Online Education Firm), Seoul, South Korea</td>
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