

TRUST AND PARTICIPATION IN ONLINE USENET SELF-HELP COMMUNITIES

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ABSTRACT

Vulnerability and self-disclosure make trust formation a key factor in the self-help process. However, the characteristics of online interaction challenge the development of trust. This article describes a study that explored trust and participation in two online self-help communities, one un-moderated and the other moderated. Members of the un-moderated community shared a chronic physical condition and the moderated community members had a chronic psychiatric disability. The research employed observation, analysis of online discussions, e-mail interviews, and comparisons of quantitative participation parameters. The primary difference between the two communities was the moderation process, which prevented any communication from disruptive individuals. The un-moderated community challenged disruptive or suspicious individuals, which often resulted in hostile discussions. The moderated community posted guidelines for participation and encouraged social communication, which facilitated the accumulation of history-based trust. The moderated community exhibited more participation during the observation period.

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Self-help communities can play a significant role in the way people manage their health. Information and communication technology provides an opportunity for people to engage in these communities in an online environment. Virtual self-help communities are dependent on the visible participation of their members. However, active participants, the people who post and carry on discussion, are in the minority in these environments. Member vulnerability and self-disclosure make trust formation an essential component in the self-help process (Leimeister, Ebner, & Krcmar, 2005) and trust in other community members may act as a lubricant for active online participation (Bargh & McKenna, 2004). However, the characteristics of computer-mediated interaction pose a challenge for the development of trust (Friedman, Kahn Jr., & Howe, 2000). How does one decide to trust people one has never met, whose identities are difficult to verify, in an environment where there are few mechanisms to control behavior?

The objectives of the study described in this article were: (a) to examine and compare what trust conditions were evident in two online Usenet self-help communities, one moderated and the other un-moderated; and (b) to explore the potential relationship of these trust conditions to member participation. The decision to employ the presence of moderation as the differentiating variable between the two communities was taken because moderation is a prominent cue for the presence of rules or institutional safeguards, conditions that may facilitate trust development in virtual environments.

CONCEPTUAL BACKGROUND

Online Self-Help Communities

Communities and the relationships they foster are compelling themes in the study of human behavior. In its simplest interpretation, the word community refers to a collection of people who have a common bond of association that differentiates them from others (Christenson, Fendley, & Robinson, 1994). The inter-group boundary may be geographic, cultural, political, or shared interest. Communities develop unique cultures based on specific norms, customs, and, sometimes, language (Gidron & Chesler, 1994). Shared culture fosters a sense of belonging and members frequently define themselves based on the social identity of the communities to which they belong (Tajfel & Turner, 1986). A particular community may develop in response to a need for security, resources, or support. It may form to address issues of social or personal change and may facilitate personal and collective empowerment (Barak, Boniel-Nissim, & Suler, 2008).

The definition of a self-help community used in this article is based on the work of Gidron and Chesler (1994), who suggest that the social processes of traditional and self-help communities are similar. Both types of community develop distinct cultures, foster a sense of identity, provide social support, and

can be a source of empowerment for their members. This article examines online self-help communities, a type of self-help community that employs computer-mediated communication to support and empower people who share a particular health condition. The term community, as opposed to group, is especially useful in studying these types of associations because online environments tend to attract larger numbers of participants and tend to be more porous than face-to-face groups (Preece & Maloney-Krichmar, 2002).

Since the creation of Alcoholics Anonymous in 1935, people have increasingly turned to self-help communities for assistance in coping with physical illness, disability, addiction, and mental health problems (King & Moreggi, 1998). Participants in these communities “share their experience, strength and hope with each other that they may solve their common problem” (A.A., 2008). As opposed to health support communities, which are frequently professionally led, self-help communities are member governed, volunteer, non-profit enterprises (Gidron & Chesler, 1994). The underlying rationale for these communities is that the situated knowledge and support of experientially similar peers can help people living with debilitating conditions to adapt to their challenges and to reframe their identities to match a more positive life perspective (Borkman, 1999). Self-help communities act as an adjunct and as an alternative to medical model, top-down, healthcare intervention. Research indicates that these communities enhance quality of life, increase self-esteem, and, in some cases, directly contribute to improved health outcomes (White & Dorman, 2001).

Traditionally, self-help communities take place in face-to-face environments. The advent of computer-mediated communication has provided an opportunity for some of these communities to carry on their work in an internet-mediated environment (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004). The Pew Internet and American Life Project reports that 80% of American Internet users have searched for health information online (Boase, Horrigan, Wellman, & Rainie, 2006). People who seek this type of information not only visit health-related websites, but they also frequent online health communities (Madden, 2006). Online health communities can be found in a myriad of forms and can be accessed through websites, listservs, bulletin boards, and chat sites. Yahoo!Groups, alone, lists over 200,000 online groups in its health and wellness section (Yahoo!Groups, 2007).

Online self-help communities combine the advantages of face-to-face self-help communities with the accessibility, reach, and anonymity characteristic of computer-mediated communication. Participants can access these communities without geographic or temporal constraints. This may be especially important for people who have physical or social limitations and for those who are geographically isolated (Bargh & McKenna, 2004). The potential anonymity offered by online environments may also provide participants with the opportunity to manage the risks involved in sharing personal health information. The reduced cues environment of the Internet has proved to be a boon for people with stigmatizing

disorders or disfiguring diseases and may facilitate discussion of sensitive topics (Maloney-Krichmar & Preece, 2005).

Participating in an online self-help community, however, is not without risk. The characteristics of online interaction, such as identity plasticity, can facilitate excessive hostility, misinformation, and deception (Coulson, 2005). Hostile exchanges between participants can discourage self-disclosure and the exchange of information and support. A hostile environment may present too much risk for vulnerable newcomers and may drive long-time community members away (Preece & Ghazati, 2001).

The credibility of fellow participants and the trustworthiness of the information they share are especially salient to the online self-help community processes (Radin, 2006). Many people are desperately seeking information and advice about their conditions and may disclose sensitive, personal information. Many become emotionally invested in the relationships formed in this environment. Misinformation and deception represent significant risks for participants in these communities (Coulson, 2005). Misinformation can result in negative health consequences. Once deceived, a person may not trust future online relationships or information, thereby removing themselves from potentially therapeutic and supportive environments (Preece & Ghazati, 2001).

Community context appears to be another important factor in an individual's decision to participate in an electronic environment. The salience of community context in relation to a participant's social identity and resource needs may provide an impetus for active participation. For example, a gay, HIV-positive person may be more willing to ask for and to give advice and support in an online gay discussion forum about new treatments for AIDS than they would in a forum discussing gay oriented movies. At the same time, the risks and interdependencies inherent in some online self-help communities may require the development of initial trust for people to feel that they can safely participate (Leimeister et al., 2005). Without trust, both physical and virtual communities would fail to prosper (Kling & Courtright, 2003). The issue of online trust in virtual self-help communities is an understudied, yet significant, research topic. The next section provides a review of the literature on trust conditions, the facilitators of trust development, which were the focus of this study.

Trust

Although there is general consensus that trust is an essential factor in the development of interpersonal and collaborative relationships (Axelrod, 1984), there is little agreement about its exact meaning (Hosmer, 1995). Most definitions of trust, however, rest on two factors: risk and interdependence (Rousseau, Sitkin, Burt, & Camerer, 1998).

Risk occurs when a person enters into a relationship or situation where complete information is unavailable, where future outcome is unpredictable, and

where there is a possibility of loss or harm (Lewis & Weigert, 1985). Trust grows out of the interdependent nature of activity, where one party relies on another, or perhaps many others, to achieve desired results (Rousseau et al., 1998).

In his literature review of trust and distrust in organizations, Kramer (1999) summarizes six conditions that facilitate trust development. The conditions are dispositional trust, history-based trust, rule-based trust, role-based trust, category-based trust, and third-party trust.

Dispositional trust and history-based trust evolve through trust-related experiences where information from past relationships provides a basis for managing situational risk and interdependence (Boon & Holmes, 1991; Rotter, 1967). Rule-based trust presupposes a shared understanding of a system of rules and appropriate behavior in a given context (March & Olsen, 1989). Role-based trust is predicated on our expectation that people have the knowledge to carry out their roles and that accountability mechanisms are in place to assess competence (Meyerson, Weick, & Kramer, 1996). Role- and rule-based trust are useful in the initial stages of trust formation as they provide guidelines for appropriate behavior and reduce uncertainty in interdependent relationships (Kramer, 1999; McKnight, Cummings, & Chervany, 1998).

Based on social identity theory (Tajfel & Turner, 1986), category or identity-based trust suggests that we use social comparisons and categorization to assess whether other parties are similar to ourselves. Fellow category members are felt to share our values and goals, supporting a perception of interdependence and shared fate, which increases our willingness to trust their motivations and intentions (Brewer, 1996). The theory of third-party trust proposes that, in the absence of a relationship history, information from known trustworthy people facilitates the initial decision to trust an unknown party (Burt & Knez, 1995). Reputation, a form of third-party trust, refers to public information about a person's past performance that allows us to predict the likelihood of that person behaving in a similar manner in the future (Axelrod, 1984). Table 1 presents the conditions, their general definitions and operational indicators.

These trust conditions reflect cognitive, affective, and social factors, theoretical trust perspectives drawn from a variety of academic disciplines such as economics, psychology, and sociology. They encompass personal attributes and experiences of the trustor (dispositional trust, history-based trust) as well as perceived attributes of the trustee (role-based trust, category-based trust), and reflect the social structure of relationships (rule-based trust, third-party trust). This study employed the conditions described by Kramer for an analytic framework because of their multidisciplinary perspective and because they encompass the major actors and the structure of a trust situation.

Although many theorists propose that trust develops slowly over time as individuals accumulate information through multiple face-to-face interactions (Mayer, Davis, & Schoorman, 1995; McAlister, 1995), a number of researchers

Table 1. Trust Conditions (Kramer, 1999) with Definitions and Indicators

Condition	Definition	Indicators
Dispositional trust	A personality characteristic, a general expectation that others can be trusted.	Ready to give others the benefit of the doubt. Trusting behavior across contexts
History-based trust	Based on experience. Provides a basis for predicting behavior. Reliability	Presence of interactional history that provides evidence of past behavior.
Rule-based trust	Shared understanding of rules and consequences for inappropriate behavior.	Evidence of behavioral norms and consequences of unacceptable behavior.
Role-based trust	Depersonalized trust predicated on the role a person assumes and the expectation that they have the skills to perform the function. Competence	Formal or informal role obligations are fulfilled in compliance with accountability mechanisms.
Category-based trust	Perception of similarity with other category members. Benevolence	Emphasis on the differences between group members and outsiders. Fellow category members are viewed favorably and are perceived as benevolent.
Third party trust (Reputation)	Information from known trustworthy people facilitates the decision to trust an unknown party. Public information about past performance used to predict future behavior.	Engagement with an unknown party based on a previously established relationship or public knowledge of the other's past behavior.

have suggested that trust can form at a high level even when there is a limited history of past interaction (McKnight et al., 1998; Meyerson et al., 1996). Computer-mediated interaction is an example of a context where trust behaviors can occur without, what appears to be, a significant history of interaction.

Online Trust

Internet researchers acknowledge that there are distinct differences between offline and online interactions that interfere with the formation of trust

(Castelfranchi & Tan, 2001; Friedman et al., 2000; Herring, 2002; Jensen, Farnham, Drucker, & Kollock, 2000; Kollock, 1999). Since computer-mediated communication facilitates interactions between people regardless of geographic location, it potentially eliminates shared social history as a basis for trust development. In addition, online interactions are not regulated by a central authority and there is little recourse to justice for individuals who are victims of anti-social or fraudulent activity (Riegelsberger, 2005). Role- and rule-based trust conditions can also be compromised by partial membership in multiple online communities (Wellman & Gulia, 1999). This partial community membership dilutes an individual's accountability to any one community. People can easily leave, fade into the background, or find another community where they can repeat their behavior (Rheingold, 1993; Sproull & Kiesler, 1991). Moreover, the text-based nature of most computer-mediated communication allows individuals to obscure or change their identity and their interaction history (Donath, 1999; Turkle, 1995).

The most prevalent research initiatives that address online trust can be labeled "trust through security" (Nissenbaum, 2001, p. 103). According to this perspective, online trust is established by security mechanisms (for example, access control). This argument is predicated on the belief that a perfectly secure system will ensure trustworthy behavior (Castelfranchi & Tan, 2001). However, this view has been criticized as unrealistic, since online environments cannot be made totally secure (Himanen, 2001) and as a fundamental misunderstanding of the concept of trust (Nissenbaum, 2001).

When people are assured of their safety, when they are secure, trust becomes redundant (Luhmann, 1979). Eliminating risk reduces opportunities for trust formation, removing situations where a successful experience in negotiating vulnerability facilitates the development of trust (Gambetta, 1988). Paradoxically, attempts to assure trust through ever-increasing levels of security or surveillance lead to a climate of mistrust (Kramer, 1999). An emphasis on security issues may constrain the scope and quality of peoples' online participation, resulting in gated communities, characterized by suspicion and hoarding of public goods.

"People trust people, not technology" (Friedman et al., 2000, p. 35). Although security mechanisms may be valuable for the protection of computer systems and sensitive information, the trustworthiness of other human beings cannot be determined solely through passwords and surveillance. Recent research has provided some support for the proposition that participants in virtual communities employ similar trust conditions to those used by people in face-to-face settings (Jøsang, Ismail, & Boyd, 2007).

Studies by Jarvenpaa and Leidner (1998a) and Feng, Lazar, and Preece (2004) have also broadened the field of online trust conditions to include communication behaviors. Frequency of social interaction and the predictability of communication were found to enhance initial and ongoing trust

formation in virtual teams (Jarvenpaa & Leidner, 1998a). In addition, the relationship between empathic communication and interpersonal trust was found to be significant in computer-mediated text messaging (Feng, Lazar, & Preece, 2004).

Trust is contextual (Granovetter, 1985). Virtual communities are complex environments where people interact at different levels for a variety of reasons. The presence and influence of trust conditions can vary depending on the type of community and the needs of its members. Despite the argument that control of access to a community may constrain the quality of online interaction, researchers who study online communities suggest that moderation is necessary for forums that deal with sensitive or controversial topics (Maloney-Krichmar & Preece, 2005). Online self-help communities where people share their vulnerabilities may require moderation, a cue for rule- and role-based trust, in order to encourage participation. For this reason, moderation as a differentiating variable between newsgroups was chosen as a central aspect in the design of this study

CONTEXT AND METHODS

Usenet

Usenet is a decentralized, asynchronous, discussion network made up of over 189,000 online communities worldwide (Arguello, Butler, Joyce, Kraut, Ling, Rose, et al., 2006). Usenet communities are called newsgroups and discussions may be read by anyone. Discussions persist over time, with message archives dating back to 1981 (Google, 2008). Participants can maintain membership in multiple newsgroups and may employ varying levels of anonymity or identity plasticity, by using aliases, multiple e-mail addresses, and anonymous re-mailers (Pfaffenberger, 2003). Although discussions are publicly available, a minority of Usenet communities are moderated with messages vetted before they are posted to the newsgroup.

Usenet is recognized as having an untamed culture, one that emphasizes the principle of free speech (Pfaffenberger, 2003). Unfortunately, since many Usenet participants practice identity plasticity and have limited commitment to any one newsgroup, this freedom of expression is not tied to any social accountability (Herring, 2001). Newsgroups are often contentious environments, populated by individuals who actively incite hostility and who enjoy deceiving others (Pfaffenberger, 2003). Because of this freewheeling, often aggressive, culture, Usenet is a context where participation entails risk (Katz, 1998) and where trust conditions may act as a lubricant for some people's participation. Although Usenet is not as prominent a space for online community development as it once was, its unregulated environment presents a situation where trust can be studied.

Methods

The research project used a mixed method design (Creswell & Plano Clark, 2007). Mixed method research provides an alternative to mono-method qualitative or quantitative approaches when a study addresses a complex topic that requires multiple ways of knowing and a breadth and depth of understanding (Greene, 2005). The research used qualitative procedures to explore trust conditions in two Usenet self-help communities, one un-moderated and the other moderated. Quantitative procedures were employed to examine participation in the two newsgroups.

Sample Selection and Inclusion Criteria

Microsoft's Netscan Project (<http://netscan.research.microsoft.com/>) and Google Groups (<http://groups.google.com/>) were employed to search for Usenet communities that provide peer support for people suffering from medical or psychosocial conditions. Usenet newsgroups that support discussion of general health related issues such as exercise or dieting were also included in the study as people with health concerns frequently participate in these communities (Madden & Fox, 2006).

The research employed criterion sampling. Communities located via the above search were examined to see whether they met the following criteria for active online communities. Communities included in the study had to: (a) be public, with interaction in English; (b) be in existence for at least 1 year (indicating some stability); (c) have at least 40 members, as listed in Google Groups¹ (see section on ethics); (d) have a minimum of seven different individuals posting per month; (e) have a minimum of 10 posts per month; and (f) have at least 50% of new topics eliciting at least one response. The criteria were developed based on previous online community participation research (Andrews, Nonnecke, & Preece, 2003; Ridings, Gefen, & Arinze, 2002; Witmer, Colman, & Katzman, 1999). These criteria excluded inactive newsgroups and ones that were primarily newsletter or announcement focused. Ninety-four un-moderated and three moderated Usenet self-help communities met the above criteria. They included 55 medical, 22 mental health, 7 addictions, and 13 general health-focused newsgroups.

Two Usenet communities were selected from the newsgroups that met the study's inclusion criteria. A moderated mental health community was selected randomly from the three moderated newsgroups that met the study criteria. An un-moderated community could not be found to match this newsgroup. Communities that fell within the moderated newsgroup's type of condition were not similar in terms of severity of disease or stigma. An un-moderated physical

¹ Usenet newsgroups are open to the public and do not require people to subscribe in order to post a message. Subscriber numbers in this study represent an approximation of the number of group participants in each newsgroup. Newsgroups included in this study were individually assessed to ensure that they met the minimum membership number.

disability community was chosen to roughly match the moderated mental health community in terms of subscriber numbers (Google Groups), chronicity of condition, and potential for member stigma.²

Procedures

Nonparticipant observation was employed over a 3-month period in the spring of 2006 and the content of selected threads and archived messages was analyzed. Observation of the communities' interactions provided information about members' patterns of communication and participation behaviors. Message archives were accessed in order to explore community rules or guidelines and when historical background was needed to understand the context of conversations.

The second method employed was structural and content analysis of the newsgroups' discussions. A number of threads from each newsgroup were chosen based on type and popularity (number of posts in thread). Discussions selected for analysis included the most popular threads, or topics, the most popular requests for information or support, newcomer-initiated threads, and argumentative exchanges. These types of threads, especially newcomer and argument threads, may contain signals or cues for trust conditions (Herring, 2004).

The third method employed was semi-structured e-mail interviews. A public message describing the study and inviting community members to participate was sent to the un-moderated community and a similar message requesting permission to post the invitation to participate was sent to the moderators of the second community. The moderators did not respond to this message; however, they did not block a subsequent public invitation to participate from being posted to their community. Unfortunately, only two people volunteered to be interviewed, both from the un-moderated self-help community. The interviews were divided into several e-mail exchanges over a period of 2 weeks. The number of e-mail exchanges was dependent on the participants' responses to the interview questions.

Finally, quantitative information was collected to compare the communities on a variety of participation parameters. Data were collected on the numbers of subscribers, authors, and core participants (people who posted content at least 10 days per month) as well as the number of posts and replies—participation indicators suggested by Jones (1997) and Witmer, Coleman and Katzman (1999). The number of days core participants were active (posting) was also collected (Smith, 2003). Data about passive participation, browsing, or reading messages could not be found.

² A chronic condition is a physical or psychosocial ailment that is persistent and that has a limited prospect for full recovery (Rolland, 1994). Stigma refers to a negative label applied to people who suffer from physical or psychosocial conditions that are generally perceived as embarrassing, or counter to the norms or morals of a specific culture (Goffman, 1986). Some examples of chronic conditions that carry a stigma are HIV/AIDS, alcoholism, incontinence, physical disfigurement, and depression.

Ethics

The necessity of obtaining informed consent for nonparticipant observation of online communities and for analysis of message content remains a contested area in Internet research ethics (Kraut, Olsen, Banaji, Bruckman, Cohen, & Couper, 2004). However, there appears to be some agreement that informed consent may be waived for online communities that have public access, including public access to archived messages (Ess & AoIR Ethics Working Committee, 2002; Walther, 2002). This is especially true if there is a prominent disclaimer about the public nature of the online interaction and if the community has a more than 10 members. This is thought to hold true for most online communities, including self-help communities (Eysenbach, 2001).

The online communities that were observed were publicly accessible. The newsgroups also had disclaimers about the public nature of their interactions and did not have any posted research restrictions. In addition, the study inclusion criteria stipulated communities with a minimum of 40 members, which excluded very small online communities where participants might perceive their conversations as taking place in a private space (Eysenbach, 2001).

Privacy and confidentiality are also important issues when a study uses observation and content analysis of public online communities. Although the newsgroups met ethical criteria for being considered public forums, a decision was taken not to identify the two newsgroups, nor to quote from their discussions. Powerful search engines, such as Google, can be used to trace and identify participants and their newsgroup e-mail addresses by simply using a direct quote as a query. For that reason, the content of posts that were illustrative of the study's findings was paraphrased to protect the authors (Cousineau, Rancourt, & Green, 2006). Privacy and confidentiality are traditional safeguards in healthcare environments and it was felt that it would be disrespectful, if not potentially harmful, to provide information that could facilitate member identification.

Informed consent was employed for the e-mail interviews. The invitation to participate included a description of the study, what was being asked of the participants, and the risks, benefits, and measures that would be taken to protect participant privacy and confidentiality. Member participation data did not require informed consent. They were gathered from the Netscan Project, which collected data in the public domain. The study was deemed to be of minimal risk and received Ethics Review Board approval.

Data Collection and Analysis

Microsoft's Netscan Project and Google Groups were used to collect qualitative and quantitative data. The Netscan Project provided quantitative information such as the number of posts, the number of authors, and the number of days participants were active in the community. In addition to being used to select

communities, Google Groups were employed for the observation part of the study and to explore archived messages where warranted.

The study employed a computer-mediated discourse analysis framework to explore the communities' interactions. Computer-mediated discourse analysis explores context and content of social behavior in online discussions including, when necessary, an examination of the impact of medium or technical variables (Herring, 2001). The observations, the selected threads, including archived discussions, and the responses to the e-mail interviews were subjected to an ongoing analysis using theory from both the face-to-face and the online trust literatures. An initial categorization framework was based on the six conditions described by Kramer (1999) in his review of the trust literature.

The flow of interaction and the type and content of the newsgroup messages were examined paragraph-by-paragraph and assigned to categories. As other themes emerged from repeated readings of the data, they were added to the framework. Some behaviors and content of posts could be classified as belonging to multiple coding categories. NVivo 7, a qualitative software analysis tool, was used to simplify the coding process.

Quantitative data were analyzed using descriptive statistics, binomial tests, and independent samples *t*-tests conducted with SPSS 15.0 software. It should be noted that any results of the quantitative analysis are simply descriptive, as the sampling procedure in the selection of the newsgroups precludes generalization.

FINDINGS

Un-Moderated Self-Help Community

Since ethical considerations prohibit identifying the condition shared by the members and thus naming the community, the following description is offered as a means of describing the general characteristics of the newsgroup. The un-moderated community was created to address the information and support needs of people living with a chronic physical condition. As yet, there is no known cause or cure for this condition; however, the autoimmune system is generally thought to be implicated in the disease process. Diagnosis can be difficult as presenting symptoms can mimic other conditions. This illness is not considered terminal; however, complications from the disease can be fatal if not treated promptly. Some people are affected minimally and lead relatively normal lives; others have difficulty with their day-to-day functioning and lead a proscribed lifestyle. The disease can affect a person's self-concept and body image and many people are embarrassed to talk about it.

The community was created around 1996 and is open to anyone suffering from this condition and their family members. It is regarded as a valuable resource by credible online medical information sites and observation suggests that participants come to the newsgroup from many countries including Canada,

the United States, the United Kingdom, Germany, Denmark, and Australia. The community experienced moderate to high posting activity from 1998 to 2003. However, since 2004, member posts have dropped dramatically (74%), with wide monthly fluctuations. For the 3 months of observation, the community generated 1418 messages in the first month, 564 messages in the second month, and 708 messages in the third.

Since Usenet newsgroups are public, any number of people can read messages, and since some people may employ a number of aliases, it is impossible to ascertain the actual number of people who frequent this community. Google groups, however, provided subscriber numbers and Microsoft's Netscan Project provided information on the number of authors that posted at least one message in a selected period. At the beginning of the study, the un-moderated community had 365 subscribers with 132 authors posting at least one message in the first month of observation, 102 in the second, and 125 in the third month.

The community had a group of core participants, defined as members who are active at least 10 days per month. There were 19 core participants in the first month and 9 such participants in each of the remaining months. These participants assumed a variety of community maintenance roles on an informal basis such as orienting newcomers, posting research news, providing information, and diffusing hostile discussions. In addition, the newsgroup had a couple of resident experts, long-time members who had considerable experience with the disease, and who contributed specific, more in-depth information.

Unfortunately, there were a number of disruptive individuals, trolls, who frequented the newsgroup. A troll is an online participant who posts messages, usually in un-moderated public forums, in order to disrupt discussions. The content of their posts are frequently controversial, in contradiction of community norms and offensive to the members. Trolls attempt to bait the newsgroup in order to hijack conversations and incite argument (Blanchard, 2007):³

All you people do is whine and complain. No wonder your family and your docs run away from you. Get some backbone, get a life. (T1)

Thanks for you kind words, Sheldon. Now shrivel up and die. (UH1)

Member participation fluctuated over the observation period, dropping steeply after the first 4 to 5 weeks. This decline coincided with an increase in the presence of at least four disruptive individuals and with an increase in threads characterized by aggression and hostility.

Both interviewees highlighted the presence of trolls as contributing to the risk of actively participating in the community. One interviewee described being

³ The notation following the quotes refers to a community member, a troll, or an interviewee. The un-moderated self-help community members are represented by the capital letters UH followed by a number; the moderated, by MH followed by a number, the trolls by T followed by a number, and the interviewees by UHa and UHb.

attacked by a troll when first posting to the community and of being subjected to e-mail from this individual outside of the newsgroup. This interviewee remains careful about the information she shares and does not engage the trolls. Both interviewees felt that, in addition to being a risk for newcomers, the disruptive individuals sabotaged the community's constructive interactions and could potentially drive some members away.

The un-moderated community had created guidelines for acceptable and unacceptable behavior; however, participants could not enforce them. In addition, the guidelines were not prominent in the community's interactions. They were included in a Frequently Asked Questions (FAQ) message. A FAQ message is a document that describes the community's focus, its norms, and customs and often includes lists of resources for the particular condition that the members share. The un-moderated community's FAQ was posted at irregular intervals and rarely brought to the attention of new participants. Neither of the interviewees, both long-time community members, mentioned the guidelines when asked about rules for member participation.

The community, however, had developed some informal practices for moderating unwanted behavior. These practices included the development of FAQs about the community's trolls, documents describing the disruptive individuals past history, as well as information about how to block unwanted communication. In addition, some core members took on the role of orienting new people to the disruptive elements in the newsgroup by engaging the trolls in arguments that revealed their true agendas. As one of the interviewees reported:

The way it was done is some would post to thread and tell me what the person was about or even also tell that person off. I would get emails telling me that I was to ignore the disruptors and leave them for them to tend to for me. (I didn't know anything about filtering people back then.) The disruptor or troll would be taken care of by others in the group and I mostly stayed out of it. (UHa)

This core member activity can be seen as a form of informal moderation and may signal role-based trust as well as core member competence.

The community threads selected for more in-depth examination were chosen based on discussion type and amount of interaction. They consisted of the most popular general thread, the most popular request for information, and two threads initiated by newcomers. The most popular general thread during the observation period was a fragmented and hostile discussion that developed in response to a message that was posted to the newsgroup by one of the resident trolls. Core members responded to this message and identified its originator as a troll. They responded in an aggressive manner, criticizing the thread initiator not only for this post, but for past behavior as well.

In response to a participant's frustration with the discussion, core community members acknowledged that they were purposefully feeding the trolls. They

expressed concern that newcomers and people desperate for a cure would follow the advice in the troll's message and potentially harm themselves. Core participants viewed the discussion as an opportunity to educate newcomers and people who passively participate in the community. One of the interviewees reported that this was a reason for the newsgroup's rejection of formal moderation:

[Moderation] would get rid of the commercial messages and the trolls but would also remove the opportunity to educate/warn other members about them. People get so desperate for a cure or at least a remission that they will try just about anything. I think that the general opinion in the group is against a moderator. (UHb)

Although some members attempted to divert the discussion to more productive ends or to interject a bit of humor, the overall tone of the most popular thread was argumentative and at times abusive. The interactions in this thread may be interpreted as informal moderation with the core members assuming moderator, harmonizer, and expert roles. Although this discussion provided some cues for rule- and role-based trust, it was questionable whether the aggressive tone of this thread would facilitate trust development or invite productive participation.

Requests for information made up the bulk of the discussion topics initiated during the observation period. The second most popular discussion topic was a request for information about alternative treatments. The community's resident experts responded to this request with advice and lists of reputable resources that could provide information on alternative treatment options. They also cautioned the poster about quacks and referred her to Quackwatch, the non-profit website that attempts to combat health-related fraud. By having knowledge of these resources, presenting them in a balanced manner, and by referring people to credible sites, the knowledgeable members supported their claims for expert status. The interaction around this request highlighted role-based trust.

Unfortunately, three trolls entered the conversation. This time, a community member posted an extensive FAQ about one of the disruptive individuals and identified the other trolls who frequent the newsgroup, describing their behavior. The FAQ, which contained information about the troll's history of behavior and interaction, provided cues for reputation and third-party trust, or, in this instance, distrust. A couple of posters reported that they participated less in this community because of the increasingly disruptive quality of the interactions. These participants expressed that the community was very important in their lives and that they regretted the direction it was now taking.

Both the interviewees expressed that they had benefited from being members of this community. One of the interviewees commented that although she was not as active as before, she would feel like she had lost a family member if the community were gone tomorrow. The other interviewee reported that he found the newsgroup useful as a source of information and fellowship. By being a member

of this community, he felt that he was not alone. Even taking into account the disruptive elements, he would recommend this community to others.

The newsgroup received, on average, one thread per week initiated by a newcomer to the community. Some newcomers introduced themselves and provided details about their illness, the tests that they had endured, and the various treatments that they had undergone. Others were more reticent about giving this type of detailed information and were treated with more suspicion by the newsgroup. One interviewee described this process as a form of moderation and suggested that this may be a way that the community assessed a new individual's trustworthiness.

In the first newcomer thread, the new participant provided a detailed description of his condition and asked specific questions about medication and treatment. By being detailed and specific, the newcomer attempted to portray himself as similar to others in the community and therefore worthy of their trust. The community was welcoming, supportive, and empathic, responding with details of their own experience with the disease. As people shared their trials with this condition, they expressed a sense of being in the same boat, of having similar life experiences. They also reassured the newcomer about the community:

Welcome John! This group has loads of information and people with tons of experience. Keep asking questions. We have all been there. We have some questionable people around, trolls, but we can manage them. They are not nearly as bad as some in other newsgroups. (UH6)

Thanks to all who answered my questions and no attacks, Wow! I am scared to open up to people about what I am going through . . . maybe this group can help. (UH27)

So sorry you have to be here. Don't be afraid to talk about anything, we know what it's like. (UH4)

Someone who admitted that they had been lurking in the background for quite some time posted the second newcomer thread. Core community members welcomed the person to a club in which no one wanted membership. Both of these threads highlight instances that signal identity-based trust.

Moderated Self-Help Community

Again, to protect the identities of community members, the following is a brief description of the condition addressed by this moderated newsgroup. The moderated self-help community was created to provide support and information for people who suffer from a chronic psychiatric condition. The condition is a very common, chronic or recurrent psychosocial illness. There is no single cause for this condition; however, it is thought to be influenced by a combination of biological and individual circumstances. The condition can be somewhat difficult to diagnose and treat, as it may be concomitant with other physical and

psychosocial conditions. For some people, the manifestation of this illness is mild and easily treated; for others it results in significant distress that affects all areas of their lives. Since this is a mental health condition, many people are embarrassed and have difficulty talking about it.

The community was created about 5 years ago. The participants felt that in creating a moderated newsgroup, where they had some control over disruptive elements, they would be better able to provide a safe, supportive environment. The newsgroup quickly became very active and is regarded as a valuable resource by respected health care websites. Members of this community come from many countries, including the United States, Canada, the United Kingdom, Ireland, South Africa, and Australia.

The moderated community employed an automated moderator program that filters messages and accepts or rejects posts based on criteria developed by the community. The newsgroup does not allow verbal abuse, posts that question or undermine the community's understanding of their condition, and overly critical messages about the moderation process. Commercial advertisement and excessive or inappropriate cross posting are other behaviors that are not tolerated. Human moderators delete posts that break the community's rules and, if the author re-offends, they are added to the auto-reject list. The rules are posted to the newsgroup each week.

At the start of observation, the moderated community had 351 subscribers with 82 authors posting at least one message in the first month of observation, 93 in the second, and 89 in the third. The community was very active, with some fluctuation in the level of member interaction. For the 3 months of observation, the community generated 2125 in the first month, 2640 in the second, and 2533 messages in the third.

Similar to the un-moderated community in this study, this newsgroup had a core group of members that participated at least 10 days per month. There were 20 core participants in the first month, 25 in the second, and 21 in the third. Core members assumed specific community roles for extended periods; for example, at least two participants acted as moderators, one person took on the role of welcoming newcomers, and another posted the weekly and monthly FAQs. These individuals acted in a consistent manner, following what appeared to be an understood and negotiated community maintenance process. In addition, the community had recognized experts, some of whom were health professionals who also suffered from this condition. These health professionals, however, did not assume any community governance roles.

The newsgroup's charter makes a point of actively encouraging off-topic posts or general conversation type threads. Indeed, general discussions were the most popular threads each month. The community employs these discussion threads to build community. Members respond with personal anecdotes, humor, and, frequently, with intimate details of their struggles. These threads can last for days, sometimes months, and spawn other off-topic conversations. Members

are encouraged to communicate often, which provides them with opportunities to share many facets of themselves and their day-to-day lives.

The most popular thread was a conversation that explored members' thoughts and feelings about having a chronic psychiatric condition. Participants shared detailed descriptions of how this condition affected their lives and the lives of people close to them. They spoke of their fears, their feelings of loneliness, and their pessimism about any future improvement. By revealing so much intimate information about themselves, participants were engaging in and modeling trust behavior.

Do you ever feel like you did before this all started? (MH21)

No! Too much has happened. I can never be 'right' again and neither can my family and my friends. This disease has robbed me of my life and there is no turning back. Oh Boy. Really down today. Sorry if I rained on anyone's parade. (MH3)

Hugs (((((((((MH3)))))))))) Not to worry, we all have days like that. I often feel like I have disappointed everyone that has come in contact with me, including the health care professionals. (MH15)

Yeah . . . I told my Doc that I felt like I was wasting his time and maybe he should concentrate his resources on someone with a better chance of recovery. He fortunately disagreed with me. (MH21)

I try to hold onto my sense of humor. But I often feel like just giving up and crawling into my bed for the day or the week. Hugs to all. (MH21)

Although the tone of this thread was often raw and bleak, it exhibited a number of trust conditions. By sharing detailed information about personal experiences, members contributed to the community's development of history-based trust. Modeling trust behavior, also contributed to this condition of trust. It provided evidence of the newsgroup's supportive and non-judgmental culture and their acceptance of each other. By focusing on their shared feelings about this chronic condition, participants highlighted their similarities to each other, as well as their differences from the normal population. This reinforced the members' perception that they were alike and signaled identity-based trust.

Not surprisingly, since this newsgroup focuses on a chronic psychiatric condition, the next popular type of thread is requests for support. Requests for information, usually about medication or other types of treatments, do not normally generate lengthy discussions. The interactions are often limited to a few members and are frequently addressed to the community experts.

The next thread analyzed was a request for support from a member who was struggling to make some small change in her behavior. The community member outlined what she was going to do and the other participants, including the community experts, helped her to decide what would be the best approach for

her to take. The community was encouraging and expressed that they were there for her and that she was not alone:

Don't try to do it all at once. Break the xxx down into more manageable pieces and only try the first step or two if you want. (MH7)

Just planning it out is a step in the right direction. Don't force yourself. There are no heroes here. (MH12)

Whatever happens we care for you and we are always here. (MH7)

The participant then attempted the change and reported to community on the outcome:

Of course you're anxious. But you did just fine. You made it past the first hurdle and you only had a small setback when you tried to go even further. You can now concentrate on how to achieve the next step and we will help you. (MH7)

Bravo. I am really proud of you. And envious, don't know if I could do it. (MH6)

The messages in this conversation were uniformly positive, empathic, and accepting. The thread provided examples of identity and empathy-based trust and interactions with community experts provided cues for role-based trust.

There were less newcomer-initiated threads for information or support in the moderated community than in the un-moderated newsgroup. However, the community regularly posted FAQs and a variety of messages that provided information about the condition, including coping strategies, resources for financial assistance, and news of recent research. Monthly FAQs included a list of medications commonly prescribed, a list of professional and organizational resources, a bibliography with review articles, and a list of other self-help communities and websites devoted to this particular topic.

In both newcomer threads, the same core member took on the role of orienting the new participant to the community and to the resources available. The newcomers were referred to the community charter and were told about the regularly posted FAQs. Other core members, including resident experts, provided support and advice. For the new participants to this community, these threads signaled the consistency of rule- and role-based trust. One newcomer described the newsgroup as appearing to be a safe and secure place where people could bring their problems without fear of harassment.

Perhaps because of the moderation process, there were no obvious hostile or excessively argumentative threads. When differences of opinion arose, the participants treated each other with respect and agreed to disagree, which usually ended the discussion. Of course, participants may have taken their disagreements out of the community environment into personal e-mail to avoid being added to the auto-reject list.

Participation

In order to compare the participation patterns of the two communities, the study collected data on the number of subscribers, authors, people posting messages, and core participants. It should be noted that trolls were very active in the first 4 to 5 weeks of the un-moderated community observation. Participation declined in that community in the second month of the study.⁴

There was no significant difference between the numbers of subscribers in the two newsgroups. A *z* approximation test indicated an observed proportion of .51 for the un-moderated community and .49 for the moderated community did not differ significantly from the hypothesized value of .50, two-tailed, $p = .60$. However, the number of authors posting at least once to the un-moderated community (359) was significantly more than the number in the moderated community (264), $p = .01$. The number of core participants in the un-moderated community (37), however, was significantly less than in the moderated community (66), $p = .006$. In other words, the un-moderated community had more one-time posters than the moderated community, which had significantly more core members participating during the observation period.

The study also collected data on interaction parameters. The parameters included the numbers of posts and replies, indicators suggested by Jones (1997) and Witmer, Coleman, and Katzman (1999), as well as the number of days core participants were active (Turner, Smith, Fisher, & Welser, 2005). Independent-samples *t*-tests were conducted to evaluate whether there were significant differences in these parameters between the core participants in the un-moderated community and the moderated community. Since the Levene's test for equality of variance was significant for posts and replies, the *t*-tests for unequal variances were used in the analysis of these two parameters. The Levene's test for equality of variance was not significant for days active; therefore, the *t*-test for equal variance assumed was employed in the analysis of this parameter.

The results indicate that during the observation period the mean number of posts, replies, and participant days active were all significantly less for the un-moderated community ($N = 37$) than for the moderated community ($N = 66$). The mean number of posts for the un-moderated community ($M = 43.95$, $SD = 24.84$) compared to the moderated community ($M = 94.38$, $SD = 81.03$) resulted in $t(84.33) = -4.68$, $p < .000$ (2-tailed). The mean number of replies for the un-moderated community ($M = 40.65$, $SD = 25.03$) versus the moderated community ($M = 86.73$, $SD = 73.95$) resulted in $t(87.67) = -4.61$, $p < .000$ (2-tailed). The mean number of core participant days active for the un-moderated community ($M = 16.24$, $SD = 4.73$) compared to the moderated community ($M = 19.44$, $SD = 5.95$) resulted in $t(89.30) = -2.99$, $p < .005$ (2-tailed).

⁴For a more complete discussion of the analysis and results of the comparison of participation between the two newsgroups, please see Ryan (2009).

Since there was a steep decline in participation in the un-moderated newsgroup in the second month of the study, the interaction parameters of the two communities for the first month were analyzed separately. In the first month, the results indicate that the number of posts and replies showed little significant difference, $p < .04$ (2-tailed) and $p < .05$ (2-tailed), between the un-moderated community ($N = 19$) and the moderated community ($N = 20$) and the core participant days active were not significant, $p = .14$ (2-tailed). The results of the analysis of the participation parameters in the next 2 months showed significant differences between the two communities with the un-moderated community exhibiting fewer posts, replies, and core participant days active. It appears that the active presence of trolls may have had an effect on the un-moderated community's member participation in the subsequent 2 months.

DISCUSSION

The study examined the trust conditions in two Usenet self-help communities and explored the potential relationship of these conditions to member participation. Both communities were created for a similar purpose, to provide informative and supportive discussion forums for people suffering from debilitating conditions. The two afflictions were chronic in nature, not straightforward in terms of diagnosis or treatment, compromised the participants' daily functioning, and carried some amount of stigma. Both communities had a core group of participants, including resident experts, who carried the bulk of conversation and who assumed community maintenance roles. The communities were recognized as valuable resources by respected health information sites, signalling third party trust (Stewart, 2006). The obvious difference between the two newsgroups was the presence of a formal moderation process in one community, which prevented the disruptive behavior experienced by the second community. The un-moderated community was plagued by the presence of at least four disruptive individuals. Trolls are detrimental to trust and to relationship development as they trade in deception (Donath, 1999). The moderated community chose to employ an enforceable system of moderation, which is a highly visible cue for rule-based trust and is an example of "trust through security" (Nissenbaum, 2001, p. 103).

Although the choice of formal moderation is the obvious difference between the two newsgroups, the way that the two communities employed and emphasized other trust conditions contributed to each communities' quality and pattern of participation. The un-moderated community employed informal rule- and role-based trust, identity-based trust and, through the employment of troll FAQs, reputation-based trust. Empathic and supportive messages were evident among the core participants. Unfortunately, challenging the trolls and other suspicious people resulted in unproductive discussions that were frequently hostile in tone. Hostile exchanges discourage self-disclosure, the exchange of information, and

may drive newcomers and other participants away (Coulson, 2005; Preece & Ghazati, 2001). Online communities that exhibit this type of behavior have been associated with decreased trust and emotional support (Maloney-Krichmar & Preece, 2005; Wright, 2002).

Although formal moderation appeared to be a powerful trust condition, it was not the only trust condition employed by the second community. An important facilitator of interaction in this newsgroup was the weekly-posted guideline that actively encouraged frequent general or off-topic discussion. The general discussions in this community not only provided detailed information about the members, cues for history-based trust, the off-topic threads also supported frequent social communication. In addition, members assumed responsibility for specific community roles and acted consistently in carrying out these responsibilities. This consistent communication pattern and the frequency of interaction have been reported to enhance initial trust formation in online environments (Jarvenpaa & Leidner, 1998b). The combination of moderation, community guidelines for participation, and consistent role behavior built institutional trust (rule- and role-based trust), which reduces uncertainty in interdependent relationships (McKnight et al., 1998).

Identity-based trust and empathic communication were also prominent in the moderated community. Participants frequently discussed their differences from the normal population and the experiences that they shared, reinforcing the community's social identity. The overall tone of this community was positive, empathic, and accepting of the individual member's beliefs and behavior. The employment of all these trust conditions contributed to an environment where people felt that they could take risks and thereby engage in trusting behavior. Table 2 summarizes the comparison of the two newsgroups.

The examination of the two newsgroups revealed differences in the pattern and the amount of member participation patterns. The most popular discussion threads in the un-moderated community were information seeking, followed by general discussion. In the moderated community, the most frequent discussions were general topic interactions, followed by threads that sought or provided support. Discussions in the un-moderated community were hostile and argumentative when trolls were present. Argumentative discussion was absent in the moderated community. Results of binomial tests to compare participation patterns indicated that the un-moderated community had more one-post authors or, as described by Putnam, "drive by relationships" (Putnam, 2000, p. 177). The moderated community had significantly more core members participating with little fluctuation in the amount of interaction.

Independent samples *t*-tests for number of posts, replies, and active core-participant days indicated that the moderated community had significantly more participation than the un-moderated community during the observation period.

Table 2. Comparison of Community Characteristics and Conditions of Trust

	Un-moderated community	Moderated community
Condition	Chronic, physical condition, difficult to diagnose and treat, compromised lifestyle, some stigma	Chronic, mental health condition, difficult to diagnose and treat, compromised lifestyle, some stigma
Purpose	Information and support	Information and support
Reputation	Recognized by credible medical sites	Recognized by credible medical sites
Moderation	No	Yes
Trolls	At least four	None
History-based trust	Limited, archived interactions, troll FAQs	Frequent self-disclosure of personal and everyday information
Rule-based trust	Informal guidelines, posted infrequently, no sanctions	Formal enforceable rules, posted weekly
Role-based trust	Informal assumption of roles by core participants	Formal consistent assumption of roles
Category-based trust	Frequent reference to the uniqueness of the community	Frequent reference to the uniqueness of the community
Third-party trust	FAQs about known trolls	None evident
Social interaction	Limited, among core members	Daily, supported by community charter
Tone	Frequently hostile and aggressive	Consistently positive, no arguments

The un-moderated newsgroup experienced an increase in disruptive behavior, coinciding with an increase in the presence of trolls primarily in the first month of the study. There was a sharp decrease in the number of core participants, number of posts and replies, and the number of days active in the following two months. The moderated newsgroup did not show such variation, perhaps as a result of having an enforceable moderation process, guidelines for consistent and frequent communication, and empathic almost exclusively supportive interactions patterns, which facilitate strong community identification (Brewer, 1999).

The study has a number of limitations that require the results to be interpreted with caution, the foremost being that the study was not based on a random sample. Random sampling is problematic in Internet research. There are unknown numbers of online self-help communities and identifying members of these communities is difficult. The research employed criterion sampling in an attempt to address this issue; however, this type of sampling does not allow the results to be generalized to other online self-help communities outside of the study.

Although this study employed a combination of methods, the lack of interview volunteers from the moderated community and the very limited numbers of interviewees from the un-moderated community make it difficult to verify the research results. In addition, only one person, the author, carried out the coding of behavior and text and the reliability of the coding was not tested. Finally, context is an important component in the initial development trust. The two newsgroups studied had similarities; however, their respective chronic conditions and the risks and interdependencies associated with their maladies could conceivably have an effect on how trust evolves in these communities (Mechanic & Meyer, 2000).

This study is a preliminary step in investigating how trust conditions may affect participation in online self-help communities. This study focused on self-help communities in Usenet, one of many online community environments that can be employed to create an online self-help community. Usenet was selected because its contentious culture may have more salience for studying trust. However, Usenet is not as popular as it once was and trust and participation research would be warranted in other online community environments such as those developed by Yahoo, Microsoft, etc. Some of the topics to explore are similar to the ones examined in this research; for example, differences in moderated and un-moderated communities and differences in emphasis on trust conditions and participant's perception of risks involved in participation. A comparison between the different types of online community environments in terms of the trust and participation needs of self-help communities could potentially provide nuanced theory about context and online trust formation. It could also provide practical information and guidance for online self-help communities.

The research presented here is one of the first studies to examine the relationship between trust conditions and participation in online self-help communities (Parr & Davidson, 2008; Radin, 2006)). As the delivery of healthcare becomes rationalized and as patient services become less available, online self-help communities will become frontline information and support resources, making research on trust development and participation in these communities a vital field of inquiry.

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