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# Psychological Barriers: Lurker and Poster Motivation and Behavior in Online Communities

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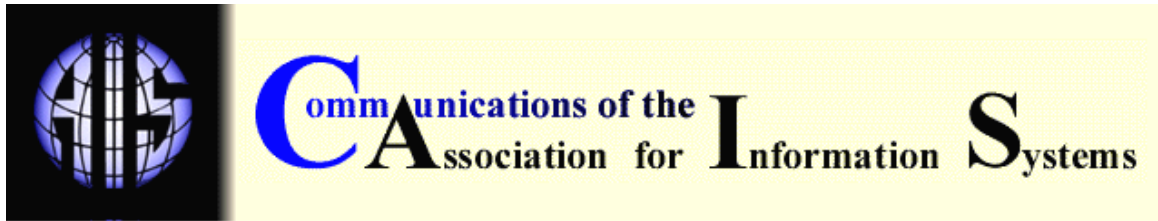
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## PSYCHOLOGICAL BARRIERS: LURKER AND POSTER MOTIVATION AND BEHAVIOR IN ONLINE COMMUNITIES

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### ABSTRACT

Virtual communities provide an attractive place for organizations to mine information regarding customer perceptions, needs, and demographics; as well as to generate revenue through sales of products, services, information, and advertising. However, the community conversation provides information about only one type of community user, the poster. Information about the lurker, who never posts, is conspicuously absent from the obvious community data source, the postings. Lurkers may be a large portion of the user community and could provide key revenue sources and vital information, or they potentially could turn into posters.

This research contrasts the differences in the underlying motivations of lurkers, infrequent posters, and posters in order to understand the resulting differences in their behavior. 518 users from 20 virtual communities were categorized into three groups based upon their posting behaviors: lurkers who never posted, infrequent posters who posted three or less times per month, and frequent posters. Results revealed that lurkers differed significantly from posters, especially in their willingness to give information and exchange social support. There was a gradual progression from lurker to poster regarding the desires to get knowledge and obtain shopping information. Implications about a possible psychological barrier regarding giving information and social support are discussed.

**Keywords:** virtual communities, trust, lurkers

### I. INTRODUCTION

Virtual communities are groups of individuals whose interpersonal relationships online are of sufficient strength - as evidenced by common interests, norms and regular communication - to form virtual communities. It is important to note that there is a "sense of community" (Blanchard and Markus, 2004) that makes the group a true community and not simply a collection of individuals meeting online. Technically, the communities can be implemented using either

synchronous or asynchronous technologies (Lee et al., 2003). Synchronous technologies include online chat, instant messaging, and real time virtual reality spaces. Asynchronous technologies include newsgroups, bulletin boards, and email list servs. Regardless of the technology, the essence of the community is the member-generated content produced by the communication.

Virtual communities are attractive to businesses for many reasons. Because the users of these communities have similar, focused interests, their conversations provide a wealth of knowledge about a target market. By examining these conversations, organizations can gather information about current and potential customers, and about the organization's or competitors' products (Vara, 2004; Bulkeley, 2005; Hempel and Lehman, 2005). However, reading the member-generated content is only reflective of the posters in the community – those who actively participate by posting messages. There may be a significant proportion of the community that is completely unseen – the lurkers, or members who come but do not participate publicly. Lurkers are defined as virtual community members who visit and use the community but who do not post messages.

Broadly, in synchronous communities such as chat rooms, lurker presence is usually evident with the notification that an individual has “logged on” or entered the online meeting space. In the asynchronous communities of bulletin boards, newsgroups, and online forums, lurker presence is much less obvious and usually completely unseen. To the individual community user, the only others that are readily evident are those who post. To the community sponsors and architects, however, lurkers do impact the community. They are part of the community traffic, contributing to volume on the servers, and can react to advertising and selling in the community. They participate by reading the posts of others, and may spend significant amounts of time doing so. There are indications that the majority of a users in many communities may, in fact, be lurkers rather than posters (Jones, Quentin and Rafaeli, 1999; Nonnecke and Preece, 2000; Nonnecke et al., 2004).

Since lurkers do not post, it is impossible to gather information about them in the persistent conversation. It is important to know about lurkers, however, since they are bona fide members of the virtual community and consumers of its knowledge. Thus, they may be affected by the virtual community content even if they do not contribute to the ongoing conversations. In fact, some revenue generating mechanisms, such as subscription fees, advertising, and product sales, may be tied to the number of users of the community, and not the number of posters, and therefore information about lurkers is then quite important.

If organizations are to harness the powerful potential of lurkers, it is important to understand how lurkers might differ from their posting counterparts. Certainly, on the surface, we know that they differ in one basic behavior: one group posts while the other does not. Lurkers have elaborated several reasons for this behavior: they feel they do not need to post, they want to find out more about the group before participating, they feel they are being helpful by not posting, they cannot make the software work correctly in order to post, or the community is a poor fit for them (Preece et al., 2004). Prior research has found that the reasons for going online are similar between lurkers and posters (they both want more information about the community topic and support), but that they have different attitudes toward the community, with posters perceiving that they received more benefit from the community and that their needs were better met (Preece et al., 2004).

However, although lurker and poster behaviors and attitudes appear different, these prior studies have not examined underlying issues of motivation that may explain these differences. A motivation is a desire, need or process that influences an individual's goal-directed behavior (Smith, Ronald E. et al., 1982). An understanding of these motivations can explain lurker behavior and, as discussed later, can aid virtual community sponsors and architects in addressing lurker needs and perhaps converting them into posters. Our research, using survey data from both lurkers and posters, examines this aspect in which lurkers may differ from other participants. Specifically, the study examines the motivations of lurkers to discover what might be behind these previous research findings. The research question we examine is:

### **Do lurkers differ in the reasons why they use a virtual community?**

We review previous literature to establish motivations of virtual community use in the context of social exchange theory, including the presence of trust in the community (Jarvenpaa et al., 1998; Gefen, D., 2000; Ridings et al., 2002). Our research focuses on asynchronous bulletin board communities. Asynchronous communities are easier to lurk in, and thus provide a larger user base for both the sponsor company and our research gathering. Bulletin boards in particular, rather than email listservs or Usenet newsgroups, are more easily accessed via major search engines. To clarify the difference between lurkers and posters, we also examine “low frequency posters” as a separate group, so as to verify if the differences are gradual or whether they are significant also between lurkers and infrequent posters. A survey of 518 members from 20 asynchronous virtual communities concluded that posters and lurkers differed significantly in their motivations to use virtual communities, specifically in their desire to go to the virtual community to give information and exchange social support. Additionally, lurkers had less trust in the abilities and benevolence/integrity of others.

## **II. THEORETICAL BACKGROUND**

### **DEFINITION OF A “LURKER”**

Lurking is generally known as visiting a community on a regular basis, but not posting or posting very infrequently. Lurking is usually not a negative behavior. It seems to be an acceptable and expected part of a virtual community (Preece et al., 2004). Indeed, it is not uncommon to see a message with the poster declaring that he is “delurking” or “has been lurking for a while” or “is a lurker here”. The implication behind such postings is that the individual still considers himself a lurker even after posting in the community – a contradiction in itself. Clearly posting frequency seems to be the key factor in the determination of lurker status, although strictly speaking, a lurker should be defined as someone with zero posting frequency.

Researchers have defined lurking as no posting or some minimal level of posting, such as 3 or less posts over a 12 week period (Nonnecke and Preece, 2000). There is speculation that lurkers make up to over 90% of online groups (Nonnecke and Preece, 2000; Nonnecke et al., 2004). While the inclusion of lurkers as members of virtual communities is debatable by some (Liu, 1999), many researchers do regard them as silent participants in virtual communities and, as such, members who should be of interest to companies and to researchers (Nonnecke and Preece, 2000; Preece et al., 2004). Because some members of the community may post so infrequently as to be considered lurkers by some, it may be beneficial to also consider low frequency posters as well as lurkers. Low frequency posters have the same impact on the community as lurkers – they are members whose role is not as obvious as posters. They may represent some intermediate step between lurking and posting, and, if so, understanding this step might shed light on how lurkers become posters.

Lurking is certainly desirable. Virtual communities often report their membership to be as high as the hundreds of thousands. Information overload would occur if all the members posted daily or even weekly, so some level of lurking is essential. Conversely, some proportion of members must post for the community to survive and continue. A balance between posting and lurking must exist. Certainly, there is membership attrition and membership growth and community expansion, so new posting members must constantly be sought, perhaps from the lurking population. Thus, there are two basic reasons to understand lurkers: as community users, regardless if they will become posters, and as possible future posters.

Finally, the context of lurking, i.e., the virtual community itself, is important. Common to many of the definitions of “virtual community” in the literature are the two concepts of communication and relationship building (Lee et al., 2003). These two concepts are the key differences between the online groups and virtual communities. While online groups can gather to complete organizational work tasks or short-term projects, virtual communities are longer-term, emergent, and based on

personal relationships. These differences are important in understanding why individuals visit and interact in these environments, and thus why we base this research on social exchange theory. Barriers and motivations to participate or stay invisible may be different in emergent communities than in online groups. A lurker's motivation to stay invisible may be different in the virtual community.

### **MOTIVATIONS TO VISIT A VIRTUAL COMMUNITY**

The most frequently cited reason in the literature for individuals to join a virtual community is to access information (Furlong, 1989; Jones, Steven G., 1995; Wellman et al., 1996; Ridings and Gefen, 2004). Virtual communities are unique in that most of the content is member-generated, as opposed to that provided by the site provider. The quality of the content is an important factor in the community's success (Filipczak, 1998). It has been suggested that communities must have compelling content, and that they will fail due to not having good standards for this content (Sreenivasan, 1997). This member-generated content is a source of content attractiveness that draws more members to the community, creating a loop, since more members generate more content, which in turn draws more members (Hagel and Armstrong, 1997). In view of that, knowledge and information have been cited as valuable currency or social resources in a virtual community (Rheingold, 1993; Binik et al., 1997; Hiltz and Wellman, 1997; Sproull and Faraj, 1997). The information flow in virtual communities is both ways – people visit also to give information in addition to getting it. Giving information may be an important part of a person's self-identity and may increase self-esteem and self-respect (Constant et al., 1996). Individuals may feel that they possess a wealth of information that they wish to share with others.

In addition to exchanging information, much of the literature suggests that virtual communities are places where people go to find emotional support, instrumental aid, companionship, a sense of belonging, and encouragement (Hiltz, 1984; Furlong, 1989; Korenman and Wyatt, 1996; Wellman, 1996; Wellman et al., 1996; Hiltz and Wellman, 1997; Sproull and Faraj, 1997; Smith, Marc A., 1999). Many virtual community members get help in electronic support groups for social, physical, and mental problems along with information about these problems. Early studies of virtual communities identified socio-emotional content as a major type of communication (Sudweeks and Simoff, 1999). For example, there are virtual communities for people who are recovering from alcohol and drug addiction, people suffering from diseases, and those coping with stress from major life changes such as job loss, death of loved ones, or divorce (Binik et al., 1997). Furlong's (1989) study of a community for older adults found that communicating with others was the network's most popular activity even though most members originally joined in order to access information. Smith (1999a), writing specifically about the type of virtual community that models physical places in rooms, states that people join for social reasons such as meeting friends and lovers, playing games with others, having parties, and acting out feelings.

Just as information is exchanged in both directions, individuals desire to give, as well as provide social support. Being able to provide support and information increases self-esteem, demonstrates technical expertise, earns respect and status, and is a way of responding to norms of mutual aid (Shumaker and Brownell, 1984; Wellman, 1996). People actively participate in order to help others and contribute to the community, and may also do this in order to build their own reputations (Donath, 1999). The desire to exchange social support is therefore also another important motivator in the use of virtual communities.

Finally, individuals are motivated to visit virtual communities in order to conduct online shopping activities (Hagel and Armstrong, 1997; Figallo, 1998). This might include actually buying in the community or seeking out information about online shopping, such as the best products to buy or where to go to shop. This information can be considered a subset of the desire to exchange information discussed above. Shopping information is important in communities that are not necessarily focused on e-commerce products or services in particular (say a community that discusses the best hotels in Mexico versus a community that discusses how to deal with colon cancer). Just as in offline communities it is common to ask friends where to shop, it may be common in online communities to ask other members where to find products and services online,

especially since the community environment is online. This is especially true in communities that have strong social connections and trust with members. Thus if one participates in the colon cancer community, it may be desirable to ask shopping questions there even though they are “off topic”. Many communities designate a specific area for off topic posts, although others may simply allow off topic posts anywhere in the community. Because virtual communities have been so closely linked to e-commerce, we examine the exchange of this particular kind of information separately.

### **LURKING AND SOCIAL EXCHANGE**

The motivations discussed above all involve the exchange of information, or social support between people. Social exchange theory (Thibaut and Kelley, 1959; Blau, 1964) is a way of viewing interpersonal interactions, such as these exchanges in a virtual community, from a subjective cost-benefit perspective which compares current intangible costs, such as helping others, with the expected future intangible benefits of these, such as receiving respect. It is distinctly different from an economic exchange (Blau, 1964). An economic exchange, such as buying a gallon of milk, is governed by rules and regulations. In social exchange, however, there are no explicit rules or agreements, and the actions of individuals are motivated by social behavior that is expected from others (Blau, 1964). Social exchange theory has been applied in the context of software adoption (Gefen, David and Keil, 1998; Gefen, D. and Ridings, 2002). In brief, social exchange theory regards human behavior as calculated. People chose to take part in a behavior if, and only if, their expected outcomes from it compare favorably with their investment. While this may sound much the same as an economic transaction, a major difference between a social exchange and an economic one is that there is no guarantee and no contract in a social exchange. It is literally up to the goodwill of the other party to reciprocate, and it is only if this goodwill exists that the person investing in the social exchange will gain the expected benefits. Because one must rely on the goodwill of the other party, trust is a central part of these exchanges and determines whether people choose to participate in a behavior.

Social exchange is strong also in virtual communities. Helping others and responding to their needs and questions is a social investment. It costs at least time, empathy, and effort. But people make this social investment, even though they know full well there is no guarantee the other side will reciprocate. People do this because they expect to be rewarded in some way which is important to them. They may be rewarded through a show of gratitude, such as someone saying thanks, or by someone else helping them when they need it. They may even be rewarded by feeling they have performed a good deed towards another human being and gain satisfaction from this altruistic behavior or from the knowledge they are contributing to society at large. Of course, there is a risk involved too. Not only may the other side not thank them, but they may be ridiculed. Another reason people participate in virtual communities, especially these communities of interest here which are emergent on the Internet, is the expectation of reciprocal benefits in the future (Blau, 1964). If a member helps another member by posting information or providing support, there is an expectation that someone will help her in the future. Perhaps it will not be the same member she helped, but help will come from within the community. She has performed a cost-benefit analysis before posting, and decided that the benefits of posting (feeling fulfillment from helping another, gaining a reputation in the community) outweigh the costs of providing the help (the time to respond, the possible risk of publicly posting information). If she asks for help or support, she receives the benefit of the actual information or support.

This is where the distinction between poster and lurker comes in. A poster, much as a reporter in a magazine, adds to the threaded discussion and by doing so contributes to determining its nature and value. The poster actively invests and, viewed from a social exchange theory perspective, does so in the expectation of receiving benefit from doing so, benefit through recognition, through influencing the nature of the community, and through knowing he or she helped another person. This is one distinct social context that the poster experiences in the community. The lurker also participates in the virtual community but in a different way; and hence, his or her social exchange, and the social context that the lurker experiences, is also different.

Lurkers invest time, but not reputation or empathy because no one knows what they are doing. And, much as a magazine reader, they do so probably expecting a reward for this investment. Their reward, in contrast to the active poster, is limited to learning something new or reading something interesting. As a result, lurkers play a much lower stakes game when participating in their social exchange in a virtual community.

One element that is crucial in making social exchange work is trust (Blau, 1964). Trust is important in determining human behavior (Gambetta, 1988), (Hosmer, 1995) and has been found to be critical in social exchange relationships (Blau, 1964; Kollock, 1994). If one does not trust, one does not willingly take part in social exchange (Blau, 1964). Trust is likely to be crucial concept in virtual communities (Ridings et al., 2002; Leimeister et al., 2005), as it is in e-commerce in general (Gefen, D., 2000; Gefen, D. et al., 2003), because in the online environment there are no guarantees of what is acceptable and what is not. When asking a question in a virtual community, one trusts that the other members will provide useful, honest, and dependable information. When asking for social support, a potentially vulnerable situation, one trusts that others will provide the support honestly and dependably. Trust is essential in the virtual community because there is no guarantor of the exchange, there is an expectation of reciprocity, and there is the social development of friendship. It is important to note that this study considers trust in others in the virtual community, and therefore it is trust in others at a collective or group level. Others (Jarvenpaa et al., 1998; Ridings et al., 2002) have applied theories of interpersonal trust at this level.

### III. HYPOTHESES

As explained above, lurkers invest much less social exchange costs and expect much less social exchange benefits than active posters do. With lesser stakes comes a lesser role for trust. Unlike posters, lurkers are not engaged in a give and take relationship and do not have any direct social interaction with the community. Although lurkers may appear on the surface not to contribute to the community because they do not post, they do give the posters public awareness. In an analogous manner, posters can be thought of as the reporters of a magazine. They set the tone, may have a give and take relationship with each other, and actively contribute to the relationship. Lurkers, in this analogy, are the readers of the magazine. Although they do not contribute directly and have no give and take relationship, their lingering presence does have an effect because the posters know that many others read their postings and care about what they have to say. This is explicit in many communities that post the number of "hits" or "views" for individual conversations and/or messages. Certainly, lurkers must trust the site at some level since they are users of the site.

However, it follows logically from social exchange theory that the members who post, and thus take a more active role in the exchange in the community, have a higher level of trust, because they are participating more in the social exchange, and have direct social ties with others. Intuitively, the level of trust should be less for lurkers, given their reticence to posting and their lesser involvement in the community.

Other researchers (Blau, 1964; Giffin, 1967; Butler, 1991; Mayer et al., 1995) have suggested that trust is composed of trust in abilities, benevolence, and integrity. To deepen our understanding of trust in the virtual community, we use this multidimensional view of trust. We would expect that active posters would have more trust in others than lurkers or infrequent posters for all three aspects of trust:

**H1: Trust in others' abilities will be lowest for lurkers, and highest for active posters, with infrequent posters in between.**

**H2: Trust in others' benevolence will be lowest for lurkers, and highest for active posters, with infrequent posters in between.**

**H3: Trust in others' integrity will be lowest for lurkers, and highest for active posters, with infrequent posters in between.**

The second set of hypotheses mainly verifies the poster versus lurker status. Posters are defined as those who actively participate. Based on the Theory of Reasoned Action (Ajzen, 1991) this poster behavior should represent stronger behavioral intentions to participate in the virtual community than those of the lurkers. The hypotheses capture these stronger intentions. This set of hypotheses is examined in the context of what previous research has offered as three basic motivations for virtual community use: to exchange general information, social support, and shopping information (Furlong, 1989; Jones, Steven G., 1995; Wellman et al., 1996; Ridings and Gefen, 2004). We would expect that active posters would have stronger desires to participate in the social exchange in the virtual community than lurkers or infrequent posters:

**H4: The desire to participate in the exchange of information will be stronger for infrequent posters compared to lurkers, and strongest for active posters.**

**H5: The desire to participate in the exchange of social support will be stronger for infrequent posters compared to lurkers, and strongest for active posters.**

**H6: The desire to participate in the exchange of shopping information will be stronger for infrequent posters compared to lurkers, and strongest for active posters.**

#### IV. METHODOLOGY

The research question was examined by posting a link to a survey in virtual communities on the Internet in order to elicit participation from lurkers who might not participate in the communities, but might fill out an anonymous survey. The specific sampling procedure is detailed in the next section. Bulletin board virtual communities were chosen for this study because it is easier to lurk in asynchronous communities such as bulletin boards or email lists than it is in synchronous communities like chat rooms. Additionally, bulletin boards are more germane to e-commerce activities because businesses can implement bulletin boards as part of their web site and can post banner ads directly in the community without interrupting the flow of conversation in the threads of the boards. Moreover, communities that use bulletin boards or newsgroups offer a unique characteristic in that one can observe the community interaction without explicitly joining the community. Lurkers may be more prevalent in bulletin board communities since they do not have to take the active step of formally joining the community, (such as they would with an email discussion list) but can simply visit the site when they wish. In addition, since some virtual communities keep the conversations for weeks or months, and others indefinitely, the data allows potential members to review the community interaction before joining. This condition also gives the researcher an opportunity to observe a community before deciding to include it in a study.

There is a caveat to such studies, however. It is much more challenging to calculate lurker statistics in bulletin boards than in email discussion lists. For email lists, there exists a list of subscribers that can be compared to the list of people that post. Bulletin board systems typically do not have subscriber lists and very often anyone visiting the site can post. Therefore, while some studies exist which have examined lurkers in email discussion lists (Nonnecke and Preece, 2000), few have attempted to look at lurking on bulletin boards.

#### MEASURES

All survey items are presented in Appendix I. Measurements for standard demographic characteristics such as gender, age, ethnicity, and education were implemented as single items with one of several possible responses. Self-reported virtual community use was measured on two dimensions: the number of hours spent in the community and the length of time (in months) of membership. Self-reported posting behavior was measured by the number of new thread posts per month (posts not in reply to another post), and the number of responses to other posts per month. For the other constructs, existing scales from the literature were reviewed and items were



carefully adapted or developed and were measured with 7 point Likert-type scales ranging from strongly disagree (1) to strongly agree (7), or “not at all (1) to “a lot” (7).

Both a pretest and pilot study were conducted. First, the survey was reviewed by four individuals who were heavy virtual community users. The survey was completed by each of the individuals and, in addition, the individuals provided feedback regarding the wording and content of the items on the survey. Following this pretest survey completion, debriefing was conducted with the four individuals to review questions and further validate the instrument. Each of the respondents who participated in the pretest spends an average of 3.5 hours per week in virtual communities, and each had been active in virtual communities for approximately three years. Minor revisions, such as grammar and wording changes to clarify meaning, were made to the survey as a result of the pretest. Following this pretest, a pilot study was conducted in order to further test the feasibility of this research. A total of 70 usable surveys were received from five different virtual communities. Again, minor revisions were made to the survey as a result of the pilot.

### **Trust**

Trust is considered a belief in this study. The measurement of the components of trust (benevolence, integrity, and ability) was taken from Jarvenpaa, Knoll, and Leidner (1998). The scales were altered slightly to fit the virtual community environment.

### **Desire to Give and Get Information**

Scales to measure these desires were created specifically for this study. Drawing on the reasons from the literature, the items in the scale ask about coming to the community for information, facts, advice on carrying out tasks, and sharing of knowledge. The first three items focus on getting information, the last two on giving information. The internal consistency reliability and discriminant validity of this newly developed scale were validated during the pilot test of the survey.

### **Desire to Exchange Social Support**

The scale used to measure social support was adapted from Deeter-Schmelz and Ramsey (1997), which was based on the work of House (1981). Minor wording changes were made in order to make the items applicable to the virtual community environment. The items for tangible support were not used due to the virtual nature of the communities. Consistent with the use by Deeter-Schmelz and Ramsey (1997), the seven point Likert responses were anchored with the terms “not at all” to “a lot”.

### **Use of Virtual Community for Shopping Information**

Although many authors encourage organizations to establish virtual communities to enhance e-commerce, little empirical work exists about the use of virtual community content in online shopping. Thus a scale was developed specifically for this study to measure how much an individual uses the information in a virtual community for online shopping decisions. Specifically, the items asked about buying products, getting recommendations, and getting general information about where to shop in the virtual community. The internal consistency reliability and discriminant validity of this newly developed scale were validated during the pilot test of the survey.

## **V. SAMPLING PROCEDURE**

In order to collect data from a wide variety of communities and to maintain as much randomness as possible in the sample, a rigorous procedure was adopted in order to select communities for the study, recognizing the issues that come with self-selected participation (Andrews et al., 2003). A list of communities from search engine results for generic terms such as “forums”, “communities”, and “bulletin boards” was compiled. These communities were screened based on

previously developed criteria that identify active communities, such as minimal traffic volume and a minimum number of different posters (Witmer and Katzman, 1998; Andrews et al., 2003). A random number generator was used to pick forty communities from the list, and the message requesting participation in the survey was posted on each of these, directing respondents to the URL for the survey. We chose communities across a very broad range of topics because we were interested in obtaining a general sense of lurkers on bulletin boards. In addition, our hypotheses were general in nature, and made no assumptions about the type of community the individual was visiting. Other studies of virtual communities, particularly in the areas of trust (Ridings et al., 2002) and lurkers (Preece et al., 2004) have combined survey data from different types of communities together.

### **DATA COLLECTION AND RESPONSE RATE**

We collected responses for a 10-day period after posting the survey request. A total of 696 responses were received from the 40 communities. Of this total, 663 responses from 36 communities were usable. Responses were dropped from communities with fewer than 10 responses, as we felt we did not have an adequate sampling of those community members. The resulting data set contained 518 respondents from 20 communities (see Appendix II for a listing of the specific communities).

The response rate calculation is difficult since it is impossible to know how many people viewed the post requesting participation, and how many people are members of each community. One possible analog is the number of completed surveys per the number of unique visits to the survey. The rate of completions per visit was 60.66%, and the rate of usable surveys per visit was 57.71%.

### **SAMPLE CHARACTERISTICS**

The largest response from a single community was 89 (17.2%) and the smallest was 10 (1.9%). The majority of the respondents (65.1%) were male, and 77.4% of the respondents were between 21 and 50 years of age. The vast majority (90.9%) was Caucasian, and most (85.7%) had an education of at least some college. Most respondents were from the United States (92.1%) and were employed full time (72.4%). These demographics are generally consistent with most surveys of Internet users ([www.cyberatlas.com](http://www.cyberatlas.com)) and reflect the fact that the survey was posted in English on English-speaking communities. Slightly over 70% of the respondents spent from one to six hours a week in the community and about half have been in the community for less than eight months.

The community topics represented were very diverse (see Appendix II for a list of community topics). Several communities revolved around various personal interests (cats, dogs, fishing, guitars, wine, guns etc.). Some communities were centered on health concerns (chiefly pregnancy and conception), while others focused on geography (natives from the Bronx, cab drivers in Las Vegas). Some were oriented around occupations (appraisers, nurses). There were a few focused on owning a particular type of automobile.

Lurkers were defined using self-reported posting behavior. Two questions were asked regarding posting:

1. What is the average number of "new thread" posts you make a month (posts that are not in response to someone else)?
2. What is the average number of responses you post to other participants' messages per month?

Responses to the questions were gathered via options buttons, the first of which was labeled "I read, I don't post", and the rest of which were numeric answers (As shown in Figures 1 and 2

and detailed in Appendix I). Note that the responses were different for posting new threads versus responses, as we anticipated that people posted more responses rather than new threads from our anecdotal examination of communities. This prediction proved true (see Figures 1 and 2). Figure 1 shows that most respondents (n=428, 82.6%) made five or fewer new thread postings per month, while there was a smaller but significant group (n=47, 9.1%) that initiated a higher (10 or more) number of new threads. Posting replies was a more popular activity, with 101 respondents (19.5%) indicating they posted more than 18 responses a month (see Figure 2).

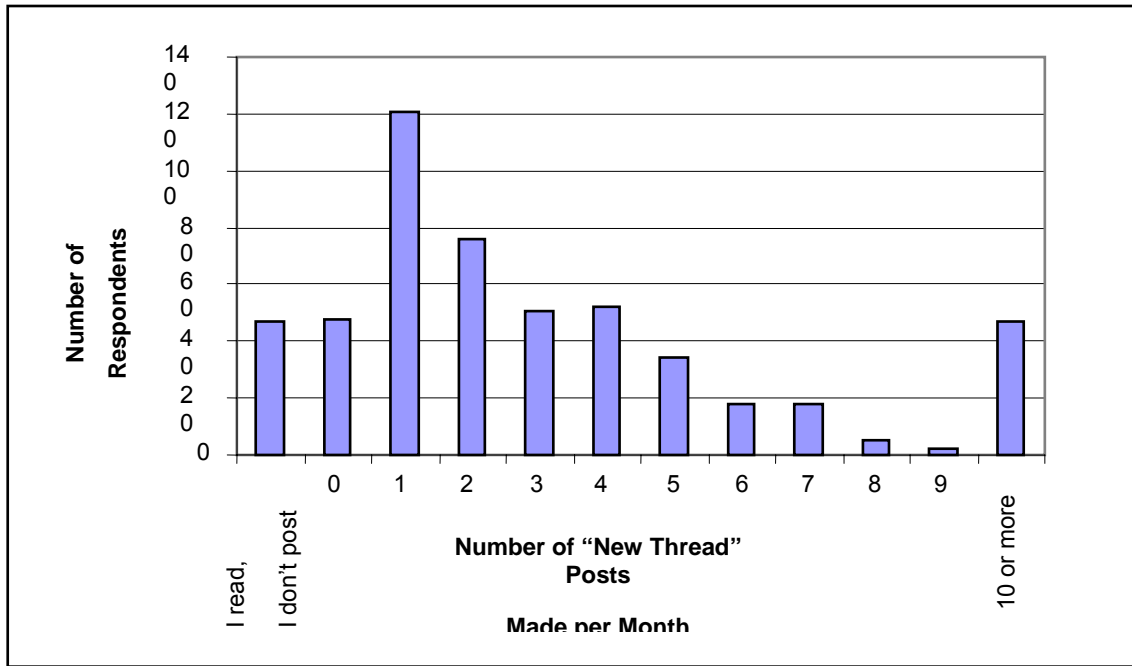


Figure 1. Distribution of Sample by Posting New Threads

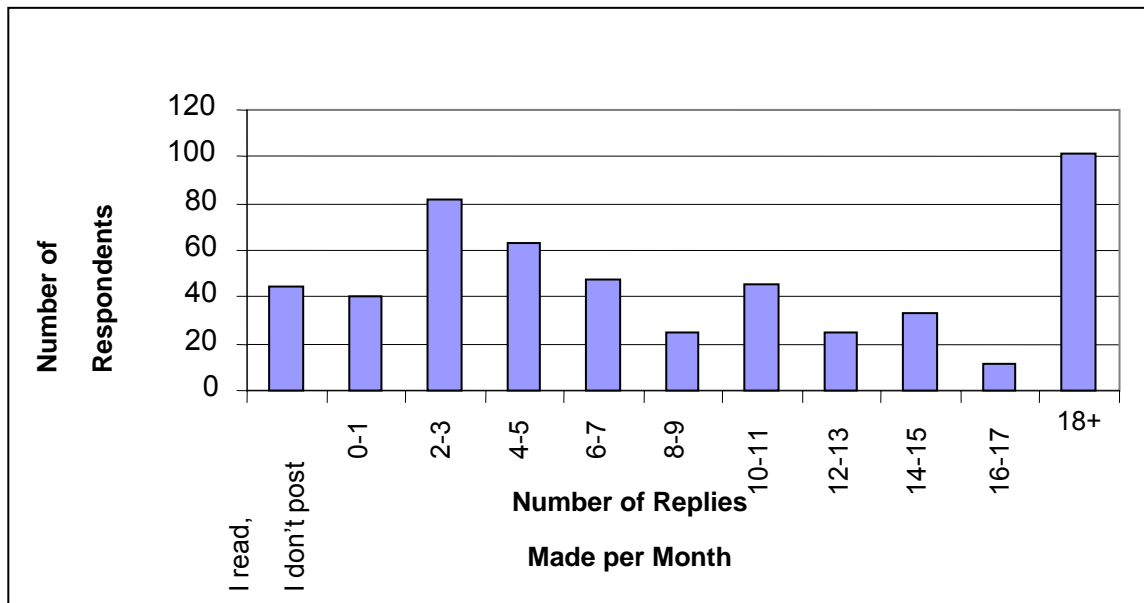


Figure 2. Distribution of Sample by Posting Replies

Definitions of lurkers are conflicting and non-specific in the literature. Nonnecke and Preece (2000) suggest that posting 3 or fewer times in 12 weeks is still such an infrequent level and should be considered lurking. However, in a later study they defined a lurker as someone who never posted in the community (Preece et al., 2004).

We therefore decided to classify our respondents into three groups: strict lurkers who reported never posting (either new threads or replies), infrequent posters who posted three or fewer times per month, and posters (those who reported posting four or more times per month). Although Nonnecke and Preece (2000) broadened their lurker definition to posting one or fewer posts per month, our analysis preserves the original strict no posting group, while adding an additional group beyond that is more than lurker but less than posters – low frequency posters. Respondents whose total postings added up to between one and three per month inclusive, from both the posting questions were classified as infrequent posters. All others were classified as posters (see Table 1 and Appendix II). Forty respondents (7.7%) were classified as lurkers, 62 (12%) as infrequent posters, and 416 (80.3%) as posters. The fact that the lurker and infrequent poster groups were smaller was expected since lurkers and people who post very seldom, as it is their nature not to actively participate, would be less likely to answer our survey, as has been found with other online surveys targeting lurkers (Andrews et al., 2003).

Table 1. Classification of Respondents by Posting Criteria

Posting Criteria	Number of respondents	Percent of total
Lurkers (no posting reported)	40	7.7%
Infrequent Posters (1-3 posts per month)	62	12.0%
Posters (4 or more posts per month)	416	80.3%
Totals:	518	100%

**MEASUREMENT OF VARIABLES**

A factor analysis using the Principal Components method with Varimax rotation was performed for all multiple-item Likert-type scales. Results suggested that several items be dropped from the scales in order to achieve a high level of reliability and validity. Specifically, an item was dropped if (a) it did not meet the threshold loading of 0.40 on any factor, (b) its highest loading on an expected factor was not above 0.60, or (c) it showed a significant variance across multiple factors (Hair et al., 1987). The resulting factor analysis after dropping items yielded six factors with eigenvalues over one, accounting for a total of 71.738% of the variance (see Appendix III).

All items loaded on separate factors as expected except for two constructs. Desire to exchange information loaded on two separate factors – one clearly dealt with giving information while one only had items associated with getting information. The trust items also loaded on two distinct factors. One factor emerged as the trust in abilities dimension. Trust in benevolence and trust in integrity were merged together in the other factor. Other researchers (Ganesan, 1994) have found similar results. Leimeister et al. (2005) describe trust in the online context as having two major supporting factors: perceived competence and perceived goodwill. These two factors are analogous to the factors that emerged in our analysis. Since very few of the integrity items remain in the factor analysis, it may be that integrity needs to be measured differently in the online environment. To maintain consistency, this factor was named trust in benevolence/integrity. All reliability coefficients were well above the commonly acceptable level of .70 (see Table 2).

## VI. DATA ANALYSIS

To address the research question and hypotheses, one-way ANOVAs (analysis of variance) and t-tests were conducted for each construct. The results are presented in Tables 3 and 4, and in Figure 3. Because our lurker and infrequent poster groups were small, we adopted an  $\alpha=.01$  cut-off for establishing significance.

Table 2. Construct Reliabilities

Construct	Number of Items	Cronbach Alpha
Trust in Abilities	6	.89
Trust in Benevolence/Integrity	6	.86
Desire to Get Information	3	.85
Desire to Give Information	2	.91
Desire to Exchange Social Support	8	.95
Use of VC for Shopping Information	4	.85

### DEMOGRAPHIC VARIABLES

Ethnicity, education, and location were not analyzed since the sample was homogenous in these regards. There was no significant difference between the three groups with regard to gender or age (see Table 3), although the means do show that posters tend to be younger. The fact that we gathered age as a range, rather than a discrete individual number, may have impacted the significance of our findings.

### VIRTUAL COMMUNITY USE

Because our research question was concerned with the motivation to use the virtual community, we first compared the use of the community by lurkers and posters both in terms of hours per week and also tenure (number of months they had been a member of the community). There was no significant difference between the three groups with regard to the number of months they have been in the particular community. There was a significant difference with regard to the hours spent in the community, with an increase in the mean of hours spent from lurker to infrequent poster to poster. Also, 56% of lurkers spend two or less hours per week in the community, and 79% of infrequent posters reported four hours a week or less. Conversely, 52% of posters report spending at least five hours a week in the community. Nearly one-fifth of posters spend more than 10 hours a week in the community. There was no difference between lurkers and infrequent posters for hours in the community ( $t=.181$ ,  $p=.857$ ), but the differences between lurkers and posters ( $t=4.778$ ,  $p=.000$ ) and infrequent posters and posters ( $t=5.737$ ,  $p=.000$ ) were highly significant, indicating that lurkers and infrequent posters were similar in this regard.

The ANOVAs for three of the four motivation constructs and both trust constructs showed significant differences between the three groups (Table 3). Individual t-tests (Table 4) were run to further explore these differences, including the non-significant ANOVA for desire to get information since it had a borderline significance value ( $p=.013$ ).

### TRUST

One-way analysis of variance was conducted to test for significant differences in the trust in other members' ability and benevolence/integrity. Both of these differences were highly significant. For both dimensions of trust, the means were increasing from lurker to infrequent poster to poster. For trust in abilities, independent t-tests verified significant differences only between lurker and poster ( $t=3.302$ ,  $p=.001$ ). Lurkers were not significantly different from infrequent posters ( $t=1.436$ ,  $p=.154$ ). The difference between infrequent posters and posters was insignificant as well ( $t=1.737$ ,  $p=.083$ ). This indicates a gradual increase in the level of trust in abilities, supporting H1, along with an increase in posting behavior. Lurkers and infrequent posters were significantly different in trust in others' benevolence/integrity ( $t=3.060$ ,  $p=.003$ ), and lurkers were also different

from posters ( $t=4.836, p=.000$ ). Infrequent posters and posters were not significantly different on this construct ( $t=1.330, p=.184$ ). Thus for trust in benevolence/integrity, there seemed to be a leap between those who never posted and those who did, indicating perhaps that this type of trust may be essential for posting to occur, partially supporting H2 and H3, since the benevolence and integrity constructs were combined.

Table 3. ANOVA Results and Means

Variable	df		Mean Square	F	Sig.	Lurker Mean (Var)	infreq Mean (Var)	Poster Mean (Var)
Hours on Board	Betwn Grps	2	81.92	25.98	.000	2.59	2.65	4.04
	Wthn Grps	514	3.15			(2.51)	(2.07)	(3.37)
	Total	516						
Time on Board	Betwn Grps	2	5.51	1.25	.287	3.98	3.65	4.09
	Wthn Grps	512	4.41			(3.67)	(1.86)	(4.62)
	Total	514						
Age	Betwn Grps	2	5.59	3.65	.027	3.39	3.55	3.13
	Wthn Grps	508	1.53			(1.00)	(1.37)	(1.60)
	Total	510						
Gender	Betwn Grps	2	.416	1.857	.157	1.24	1.27	1.36
	Wthn Grps	508	.224			(0.19)	(0.20)	(0.23)
	Total	510						
Trust in Abilities	Betwn Grps	2	5.28	6.37	.002	5.14	5.42	5.63
	Wthn Grps	515	.83			(1.12)	(0.85)	(0.80)
	Total	517						
Trust in Benevolence/ Integrity	Betwn Grps	2	16.00	12.38	.000	4.44	5.16	5.36
	Wthn Grps	515	1.29			(1.96)	(0.98)	(1.28)
	Total	517						
Desire to Get Info	Betwn Grps	2	9.19	4.40	.013	5.11	5.27	5.67
	Wthn Grps	514	2.09			(3.20)	(2.40)	(1.94)
	Total	516						
Desire to Give Info	Betwn Grps	2	173.75	92.36	.000	2.92	4.13	5.63
	Wthn Grps	512	1.88			(2.51)	(2.51)	(1.75)
	Total	514						
Desire to Exchange Social Support	Betwn Grps	2	43.68	14.46	.000	3.02	3.38	4.24
	Wthn Grps	514	2.95			(3.19)	(2.82)	(2.95)
	Total	516						
Using VC For Shopping Information	Betwn Grps	2	19.63	6.62	.001	3.24	3.58	4.11
	Wthn Grps	514	2.97			(3.09)	(2.79)	(2.98)
	Total	516						

**MOTIVATIONS FOR USE**

Three of the four motivations (giving information, exchanging social support, and obtaining shopping information) were significantly different among the three groups in individual ANOVAs, with the means steadily increasing from lurker to infrequent poster to poster (see Table 3). Posters reported much stronger desires for all four constructs than the other three groups. In all

cases with independent t-tests (Table 4) an interesting picture emerged. Although the desire to get information was borderline significant at  $p=.013$  (using  $p=.01$  as our standard for significance), it was analyzed further.

In the two motivations where the user is going to the virtual community to obtain information (either to get general information or to get specific shopping information), at the conservative level of  $\alpha=.01$ , the progression from lurker to infrequent poster to poster is insignificant (Table 4). This indicates a general transition in this motivation, and can be expected from the increase in experience found in the reported hours of use among these different categories of users. For the general construct of simply obtaining information, even at the extreme ends of the spectrum, the lurker and the poster only marginally differ here ( $p=.017$ ), indicating marginal support for part of H4, since the exchange of information construct was split up. For the specific construct of getting shopping information, although there is a gradual progression, the lurker does differ from the poster significantly ( $p=.002$ , Table 4), indicating support for H5.

Examination of the other two motivations paints a somewhat different picture. There are large and highly significant differences between the groups for giving information (Table 3), supporting H4 for the split of the exchange information construct. For exchanging social support, lurkers do not differ from infrequent posters. However, both of these groups are very different from posters (Table 4), partially supporting H5. These results may indicate a psychological barrier between lurker and posters with regard to these two motivational aspects, while with the other aspects there is a gradual transition.

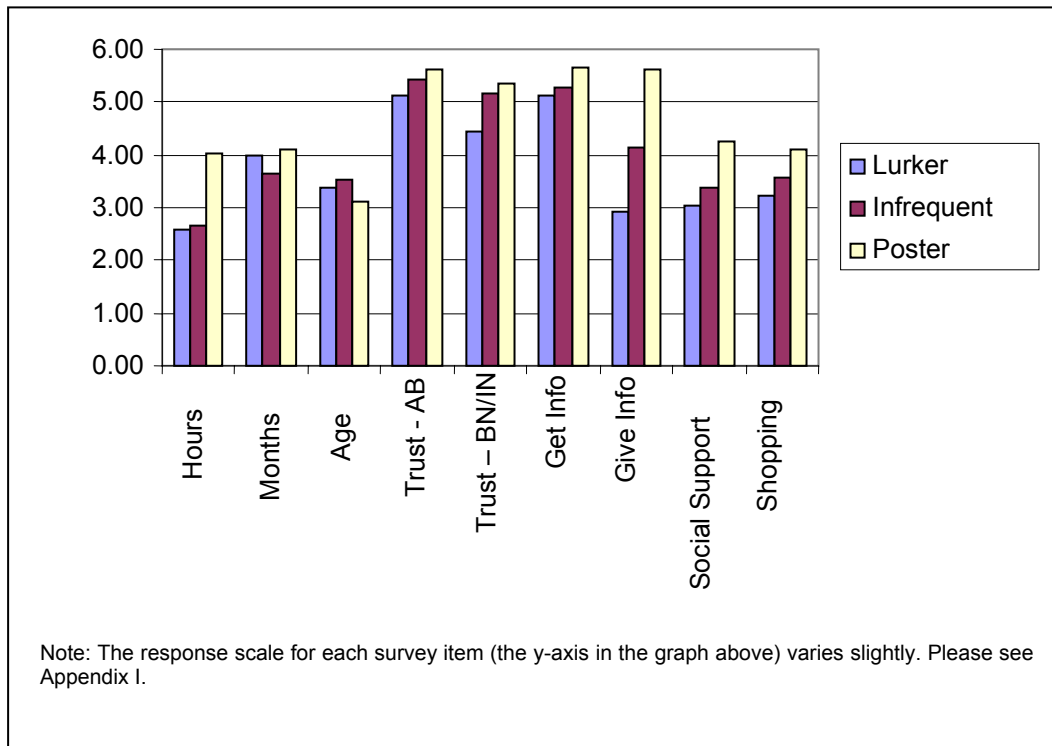


Figure 3: Lurker vs. Infrequent Poster vs. Poster Means

**VII. RESULTS AND DISCUSSION**

Our study sought to understand lurkers by comparing them with posters, and also with a group representing the middle ground of posting behavior, infrequent posters. The findings of this study reveal significant differences between the two extreme groups of posters and lurkers. Although the two groups are not diametrically opposed on the constructs, there are differences that can

impact the virtual community. Most important perhaps, these results have a high degree of external validity since the data came from actual members from a variety of real-world virtual communities. Few empirical studies have surveyed such a large number of virtual communities.

Table 4. t-Test Results for Motivation Constructs

<b>CONSTRUCT</b>	<b>Lurker v. Infrequent t-statistic (p-value)</b>	<b>Infrequent v. Poster t-statistic (p-value)</b>	<b>Lurker v. Poster t-statistic (p-value)</b>
Get Information	0.497 (.620)	2.078 (.038)	2.388 (.017)
Give Information	3.764 (.000)	8.078 (.000)	12.013 (.000)
Exchange Social Support	1.032 (.305)	3.691 (.000)	4.280 (.000)
Get Shopping Information	.993 (.323)	2.274 (.023)	3.058 (.002)
Trust in Ability	1.436 (1.54)	1.737 (.083)	3.302 (.001)
Trust in Benevolence/ Integrity	3.060 (.003)	1.330 (.184)	4.836 (.000)

While all have been members of their respective communities for about the same number of months, lurkers and infrequent posters spend far less time there. This is logical since posters not only read, but also take the time to post more numerous messages. Lurkers are not unique in their motivation regarding getting general information and specific shopping information, and users show an insignificant progression among the three groups with only the lurkers and posters being significantly different on these motivations. This gradual transition would be expected because of increased experience. On the other hand, there are significant changes in social support exchange and giving information where lurkers are below the midpoint and posters above it. This means that there may be some psychological barrier between lurkers and posters with regard to these two. So lurkers are different qualitatively, not only in a gradual quantitative way, but also in their desire for more social distance, less social bonding, and their reluctance to rely on information provided by others. This supports the assertion of the study about lurkers being unique.

Virtual communities have been established as social exchange systems that require trust (Ridings et al., 2002; Leimeister et al., 2005). Because trust has been found to be so crucial in this online context and linked to the motivation to use the community, we also examined the difference in trust between the three categories of users along the dimensions of trust in abilities and trust in benevolence/integrity. Lurkers had less trust than posters for both dimensions, and it may be this lower level of trust that prevents the lurker from participating in the conversation of the community.

Lurkers may not post new threads, for example, because of a level of distrust in the abilities of others to answer questions or give advice. They may feel that they will not get truthful or helpful answers. Likewise, they may not post responses to others due to misgivings about the benevolence and integrity of others. They also may not participate due to fear that unknown persons are mining information from the community with ill intent, and perhaps they may be the target of spam or criminal activity as a result of their participation.

One of the most interesting findings of the study was that while infrequent posters were similar to posters with regard to trust in benevolence/integrity, lurkers were very different from both groups. Thus there may be a trust barrier to overcome with regard to this specific dimension of trust that is essential before a user will begin to post in the community. In contrast, there was only a gradual progression for the other trust dimension from lurker to infrequent poster to poster. While the difference between the mean trust scores of lurkers and posters was significant, it must be noted that both means were still on the trusting side of the scale. Therefore lurkers did exhibit



trust in others in the communities (after all they did come and use the community) but, perhaps, not enough trust to post.

This finding has many implications for the design of virtual communities. If community organizers want to encourage more posting, specifically by lurkers, they might try to increase their level of trust. This could possibly be done by providing a community moderator, policing the community for unruly, untrue, or inappropriate posts, rating of other members both quantitatively (such as the number of posts) and qualitatively (such as the quality of their posts as rated by the community), and by enforcing the security and privacy policies of the community. It may also be important to help community members to easily find posts by others in the community who they trust. It may be that they form their own opinions regarding the abilities and intentions of others, and simply wish to read only the posts by these trusted others. Software designers can build in mechanisms to filter only these posts or notify users via email when the users are online or have posted.

Examining the trust of infrequent posters is more complex. Their level of trust in abilities was not significantly different from lurkers or posters. However, their level of trust in others' benevolence/integrity was significantly higher than lurkers, more like that of a frequent poster. This may indicate that they feel that others in the community will be kind and honest, and may coincide with their increased desire then to give information to the community.

Decisions about how to structure and monitor the community should be made with some understanding of its members, including both posters and lurkers. Understanding lurkers is important since they may represent a sizable portion of the virtual community membership. A virtual community may survive by sponsorship and/or advertising, and these types of revenue models depend upon the number of people who visit the community, not the number of people who post. Conversely, the success of a community also depends upon the members contributing to the conversation; thus, it may be desirable to turn lurkers into posters. Lurkers read the messages, and posters create the messages. Lurkers will not come if there are no posters. As a result, organizations need to know about these silent members. In addition, it is helpful to know the differences between the members who never post, those who post infrequently, and the very active members.

Architects of the communities, as well as the community sponsors and moderators, can encourage participation by fostering communication and building trust. Simple explicit encouragements to post are one way to communicate subtly about contributing to the public good of the community. Encouragements could be posted in the community or even emailed to the users. The encouragements could be general in nature or specific, perhaps tailored to a user's browsing behavior. For example, if a user often views postings regarding fishing in Lake Michigan, he might be sent an email encouraging him to answer a post from a user regarding that subject. Calls for new users to join in or polls or votes may also be seen as low risk ways for lurkers to start to contribute to the community.

Virtual community sponsors, organizers and moderators need to understand who lurkers are and lurking behavior for two reasons. Lurkers are users of the community and as such can be valuable and relevant for marketing and sales opportunities. Further, and perhaps even more interesting, virtual community sponsors need to have some individuals contribute to the community to a certain threshold level in order for it to survive. Therefore, it is important to turn lurkers into active posters, especially if a significant number of active posters begin their virtual community experience as lurkers. Something about the virtual community keeps the frequent posters there longer, but not the lurkers. This too is important to know because the less time people spend at a site, the less potential revenue from selling advertising or products. Thus the lurker segment may be an area that organizations must target in order to increase traffic at their site.

### VIII. LIMITATIONS AND FUTURE RESEARCH

While interesting, some limitations should be considered regarding the results above. A possible serious bias is self-selection, as well as the demographic composition of our sample, which had a very large proportion of Caucasian respondents.<sup>1</sup> Unfortunately, there is virtually no public data available about the demographics of bulletin board users. However, the present sample is fairly similar to other surveys.<sup>2</sup> Another problem is that several of the measures gathered were self-reported. Self-reported data is subject to personal memory, varying scale use among respondents, and to social desirability bias (Bellman, Lohse et al. 1999). Future studies could endeavor to match attitude and perception survey responses with actual use measurements that are available from the preserved conversation in the community and the web server logs.

Trust is a willingness to depend based on beliefs. It is not known at this stage what leads to these beliefs. What leads to these beliefs, especially in the context of the lurker, is a good topic for another study. What can be deduced at this stage is the significance of the result of these as currently unknown motivations on trust. Identifying this significance in the levels of trust, as done in this study, is a crucial first step in this direction. Additionally, trust could mediate the motivation to participate.

Another limitation of this study is the small number of lurkers who participated in the survey, and the fact that we had three communities where we could not obtain any lurker or infrequent poster participation in our survey. This is inevitable. People who wish to keep to the shadows in their community are more likely to want to keep their opinions private, too. Thus, the conclusions drawn here should be regarded as preliminary. On the other hand, considering how hard it is to convince the silent participants to nonetheless convey their beliefs, these preliminary findings provide a unique window into the world of the lurkers. Future research that could obtain much larger lurker participation could yield different results.

The generalizability of the results must be interpreted with caution. Our broad choice of community topics was an attempt to obtain a general picture of lurkers, but may have introduced sample bias due to the large diversity of types of communities sampled. Although other researchers have combined analysis of different types of virtual communities together (Savicki et al., 1996; Ridings et al., 2002; Preece et al., 2004; Herring et al., 2005), this technique may not be ideal, and future research in this area should examine lurkers in specific types of communities separately. There are thousands of virtual communities on the Internet, and the identification of the population of interest (virtual community members) is difficult at best. The response rate in this research was virtually impossible to calculate, and it is not known how the sample of 20 virtual communities compares to the total population of virtual communities on the Internet. Determination of non-response, coverage error, and the sampling frame in the online environment are impossible (Andrews et al., 2003). While the methodology employed to select communities was very rigorous, a pure random sampling of communities was not used and would, in fact, be extremely difficult to do, and is an unavoidable limitation of our study.

We have sought to examine lurking behavior and user beliefs for a member in one particular community. It could be the case that an individual is a lurker in one community but a frequent poster in another, and has very different levels of trust in a different community she frequents. Examining the behaviors of the same user across different communities is another interesting area of future research.

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<sup>1</sup> Note that our ethnicity scale is based on Georgia Institute of Technology's Graphic, Visualization & Usability Center's WWW User Survey, found at: [http://www.gvu.gatech.edu/user\\_surveys/survey-1998-10/graphs/general/q48.htm](http://www.gvu.gatech.edu/user_surveys/survey-1998-10/graphs/general/q48.htm).

<sup>2</sup>Our demographics are generally consistent with other surveys that found large proportions of Caucasians in U.S. Internet users in general (Lenhart et al., 2003) and U.S. users of online groups in particular (Horrigan et al., 2001).

Finally, we believe a fruitful and interesting area, especially with practitioner applications, would be to study the lifecycle of a virtual community user, especially with regard to the movement between the different categories of lurker, infrequent poster, and poster. It would be interesting to examine how often users move between the categories, if there is movement at all, or if there is even backward movement.

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EDITOR'S NOTE: The following reference list contains the address of World Wide Web pages. Readers, who have the ability to access the Web directly from their computer or are reading the paper on the Web, can gain direct access to these references. Readers are warned, however, that

1. these links existed as of the date of publication but are not guaranteed to be working thereafter.
  2. the contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
  3. the authors of the Web pages, not CAIS, are responsible for the accuracy of their content.
  4. the author of this article, not CAIS, is responsible for the accuracy of the URL and version information.
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**APPENDIX I. SURVEY ITEMS**

<b>Demographics – Single Items</b>	
<b>Item Code</b>	<b>Item and/or Responses Available</b>
Gender	•Male •Female
Ethnicity	<b>Which of the following best describes you?</b> •African •African American •Asian/Pacific Islander •Caucasian •Hispanic •Latino •Multiracial •Native American •Indigenous or Aboriginal Person •Other
Age	•20 and under •21-30 •31-40 •41-50 •51-60 •61-70 •71+
Education	<b>What is your highest level of education?</b> •Grammar School •High school or equivalent •Some college •Vocational/Technical School (2 year) •College Degree (4 yr) •Master’s Degree (MS, MBA) •Doctoral Degree •Professional Degree (JD, MD)
Location	<b>Where are you located?</b> •Africa •Asia •Oceania (Australia, New Zealand, etc.) •Europe •USA •Canada •Mexico •Central America •South America •Middle East •West Indies •Antarctica
Employment	<b>What is your present employment status?</b> •Not employed •Retired •Part-Time •Full-Time •Student
<b>Self-Reported Virtual Community Use – Two Dimensions – Each Single Items</b>	
<b>Item Code</b>	<b>Item and/or Responses Available</b>
Hours	<b>How many hours per week do you spend on this bulletin board (both</b>

	<b>reading messages and composing messages)?</b> •less than 1 •1-2 •3-4 •5-6 •7-8 •9-10 •more than 10
Months	<b>How many months have you been using this bulletin board (either as a reader or active poster)?</b> •less than 1 •1-4 •5-8 •9-12 •13-16 •17-20 •21-24 •more than 24

**Self-Reported Posting Behavior – Two Dimensions – Each Single Items**

Item Code	Item and/or Responses Available
New Threads	<b>What is the average number of “new thread” posts you make a month (posts that are not in response to someone else)?</b> •I read, I don't post •0 •1 •2 •3 •4 •5 •6 •7 •8 •9 •10+
Post Responses	<b>What is the average number of responses you post to other participants' messages per month?</b> •I read, I don't post •0-1 •2-3 •4-5 •6-7 •8-9 •10-11 •12-13 •14-15 •16-17 •18+

**Trust: Ability Component – 6 Items**

Item Code	Item (Responses were Strongly Disagree=1 to Strongly Agree=7)
abconfid	I feel very confident about the skills that the other participants on this bulletin board have in relation to the topics we discuss.
abknowlg	The other participants on this bulletin board have much knowledge about the subject we discuss.
abcapabl	The other participants on this bulletin board have specialized capabilities that can add to the conversation on this bulletin board.
abqualfd	The other participants on this bulletin board are well qualified in the topics we discuss.
abtasks	The other participants on this bulletin board are very capable of performing tasks in the topics we discuss.
absuccess	The other participants on this bulletin board seem to be successful in the activities they undertake.

**Trust: Benevolence/Integrity Component – 6 Items**

Item Code	Item (Responses were Strongly Disagree=1 to Strongly Agree=7)
bngetalong	The other participants on this bulletin board are very concerned about the ability of people to get along.
bndistrpt	The other participants on this bulletin board would not knowingly do anything to disrupt the conversation.
bnimport	The participants on this bulletin board are concerned about what is important to others.
bnhelp	The participants on this bulletin board will do everything within their capacity to help others.
infair	The participants on this bulletin board try hard to be fair in dealing with one another.
inmanner	The other participants on this bulletin board do not behave in a consistent manner.

**Users' desire to get information - 3 Items**

Item Code	Item (Responses were Strongly Disagree=1 to Strongly Agree=7)
rpgetinf	I come to this bulletin board to get information on particular topic.
rpadvic	I use this bulletin board when I want advice on how to carry out some task.

rpfacts	I come to this bulletin board when I need facts about a particular subject.
<b>Users' desire to give information - 2 Items</b>	
<b>Item Code</b>	<b>Item (Responses were Strongly Disagree=1 to Strongly Agree=7)</b>
rpgvinf	I come to this bulletin board to give other participants information I know about a particular subject.
rpshare	I come to this bulletin board to share my skills and abilities with participants.

<b>Users' desire to exchange social support - 8 Items</b>	
<b>Item Code</b>	<b>Item (Responses were "not at all" =1 to "a Lot" =7)</b>
	<b>To what extent do you come to this bulletin board to find others who will...</b>
sslisprb	... listen to your problems?
ssconcrn	... show concern for your problems?
ssgetadv	... give you sound advice to deal with your problems?
ssgetsug	... give you useful suggestions on getting through difficult times?
	<b>To what extent do you come to this bulletin board to ...</b>
ssthrbp	... listen to others' problems?
ssothrcn	... show concern for others?
ssothrav	... give others sound advice to deal with their problems?
ssothrsg	... give others useful suggestions on getting through difficult times?

<b>Obtaining Shopping Information- 5 Items</b>	
<b>Item Code</b>	<b>Item (Responses were Strongly Disagree=1 to Strongly Agree=7)</b>
shoprec	I depend on the recommendations of other participants on this bulletin board for Internet shopping information.
shopbuy	I would feel comfortable buying products online through this bulletin board if that service did exist.
shopinfo	If I need information on where to shop online, I can find it through this bulletin board.
shoppur	I would be very likely to purchase products through this bulletin board if that service did exist.

**APPENDIX II. VIRTUAL COMMUNITIES SURVEYED**

<b>Community</b>	<b>Community Topic</b>	<b># Respondents (% of total)</b>	<b>Lurkers</b>	<b>Infrequent Posters</b>	<b>Posters</b>
APPRAISE	Real estate appraisal	25 (4.8%)	8	5	12
AUSWINE	Australian wine	10 (1.9%)	2	0	8
BREAST	Debate on breast vs. bottle feeding babies	24 (4.6%)	2	4	18
BRONX	People who live or used to live in the Bronx, New York, U.S.A.	30 (5.8%)	2	7	21
CAT	Cat health issues	21 (4.1%)	2	2	17
CATHELP	Anything to do with cats	15 (2.9%)	1	0	14
CYCLE	Women who got pregnant at the same time (on the same menstrual cycle)	13 (2.5%)	0	0	13



ENTMOOT	The author J.R.R. Tolkien	13 (2.5%)	0	0	13
EXPECT	Expecting a baby that is not your first child	17 (3.3%)	0	0	17
FISH	Steelhead and salmon fishing	35 (6.8%)	8	5	22
GUITAR	The musical instrument guitar	32 (6.2%)	4	0	28
GUNS	Gun control efforts	18 (3.5%)	2	2	14
HIGHTEC	High tech methods for getting pregnant	15 (2.9%)	1	1	13
NURSE	The profession of nursing	9 (1.7%)	0	4	5
PICKUP	Pickup trucks	56 (10.8%)	4	12	40
SHADOW	Honda Shadow motorcycles	89 (17.2%)	2	11	76
SPRTCAR	Coupe, convertible and sports cars	10 (1.9%)	0	2	8
TACOMA	Toyota Tacoma pickup trucks	51 (9.8%)	1	2	48
TEACH	The profession of teaching	22 (4.2%)	0	2	20
VEGAS	Driving a taxi in Las Vegas, Nevada, U.S.A.	13 (2.5%)	1	3	9

**APPENDIX III. ROTATED COMPONENT MATRIX FROM FACTOR ANALYSIS**

	Component					
	1	2	3	4	5	6
SSLISPRB	<b>0.839</b>	0.090	0.164	0.028	0.202	-0.066
SSCONCRN	<b>0.853</b>	0.073	0.163	-0.003	0.193	-0.048
SSGETADV	<b>0.805</b>	0.084	0.115	0.082	0.349	-0.095
SSGETSUG	<b>0.859</b>	0.083	0.143	0.025	0.238	-0.026
SSOTHRPB	<b>0.827</b>	0.043	0.024	0.050	-0.009	0.089
SSOTHRCN	<b>0.826</b>	0.101	0.092	0.054	-0.070	0.218
SSOTHRAV	<b>0.816</b>	0.052	0.019	0.082	0.019	0.355
SSOTHRSG	<b>0.835</b>	0.076	0.054	0.041	-0.017	0.293
ABCONFID	0.084	<b>0.822</b>	0.227	0.087	0.142	-0.010
ABKNOWLG	0.088	<b>0.745</b>	0.297	0.083	0.137	-0.032
ABCAPABL	0.012	<b>0.694</b>	0.050	0.125	0.065	0.170
ABQUALFD	0.037	<b>0.852</b>	0.165	0.029	0.064	-0.004
ABTASKS	0.124	<b>0.804</b>	0.089	0.076	0.124	0.071
ABSUCCES	0.139	<b>0.667</b>	0.233	0.186	0.044	0.153

BNDISRPT	0.104	0.118	<b>0.816</b>	0.032	0.018	0.079
BNGETALG	0.092	0.282	<b>0.692</b>	0.123	-0.016	0.088
BNIMPORT	0.197	0.246	<b>0.782</b>	0.022	0.092	0.067
BNHELP	0.168	0.305	<b>0.696</b>	0.180	0.161	0.090
INFAIR	0.040	0.217	<b>0.795</b>	0.145	0.146	0.056
INMANNER	0.037	-0.013	<b>0.572</b>	-0.060	0.082	0.051
SHOPREC	0.070	0.054	0.071	<b>0.739</b>	0.220	-0.053
SHOPBUY	0.051	0.164	0.061	<b>0.846</b>	-0.042	0.092
SHOPINFO	0.017	0.115	0.054	<b>0.762</b>	0.241	0.057
SHOPPUR	0.066	0.127	0.079	<b>0.855</b>	0.003	0.095
RPADVICE	0.278	0.197	0.083	0.264	<b>0.743</b>	0.177
RPGETINF	0.123	0.119	0.146	0.077	<b>0.781</b>	0.069
RPFACETS	0.206	0.226	0.171	0.156	<b>0.799</b>	0.166
RPSHARE	0.220	0.152	0.170	0.107	0.169	<b>0.860</b>
RPGIVINF	0.191	0.126	0.207	0.076	0.184	<b>0.845</b>
Eigenvalue	9.241	4.156	2.468	1.925	1.527	1.468
% of Variance	31.866	14.332	8.511	6.638	5.265	5.125
Cronbach's Alpha	0.948	0.889	0.859	0.845	0.849	0.911

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 6 iterations.

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