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Research Note

The Impact of Community Commitment on Participation in Online Communities

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Online discussion communities have become a widely used medium for interaction, enabling conversations across a broad range of topics and contexts. Their success, however, depends on participants' willingness to invest their time and attention in the absence of formal role and control structures. Why, then, would individuals choose to return repeatedly to a particular community and engage in the various behaviors that are necessary to keep conversation within the community going? Some studies of online communities argue that individuals are driven by self-interest, while others emphasize more altruistic motivations. To get beyond these inconsistent explanations, we offer a model that brings dissimilar rationales into a single conceptual framework and shows the validity of each rationale in explaining different online behaviors. Drawing on typologies of organizational commitment, we argue that members may have psychological bonds to a particular online community based on (a) need, (b) affect, and/or (c) obligation. We develop hypotheses that explain how each form of commitment to a community affects the likelihood that a member will engage in particular behaviors (reading threads, posting replies, moderating the discussion). Our results indicate that each form of community commitment has a unique impact on each behavior, with need-based commitment predicting thread reading, affect-based commitment predicting reply posting and moderating behaviors, and obligation-based commitment predicting only moderating behavior. Researchers seeking to understand how discussion-based communities function will benefit from this more precise theorizing of how each form of member commitment relates to different kinds of online behaviors. Community managers who seek to encourage particular behaviors may use our results to target the underlying form of commitment most likely to encourage the activities they wish to promote.

Key words: online communities; virtual communities; discussion groups; commitment; online behavior; Web 2.0; social media; social technologies

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1. Introduction

With widespread adoption of the Internet, conversing with others who share similar interests has never been easier. Early in the development of the Internet, online groups—both within and outside of organizations—quickly emerged as dynamic conversation spaces (Rheingold 1993, Sproull and Kiesler 1991). A plethora of browser-based communication tools has accelerated the growth of new online discussion communities, each with its own purpose, leaders, members, structures, resources, and norms. Of the estimated one billion Internet users (e.g., Hof 2005), 84% have

participated in an online community (Horrigan 2001), resulting in an explosion of text-based conversation.

While online discussion communities are increasingly pervasive, at their core they remain voluntary structures; whether individuals participate—and in what ways—is largely their own choice (Moon and Sproull 2008). Online communities are easily found and accessed, and individuals typically have the option to come and go as they please. This might be expected to lead individuals to engage online communities as they do many other websites, through one-off transactions driven by general search and retrieval of

relevant information (Pirolli and Card 1999). Indeed, research indicates that many visitors to online communities soon disappear (Arguello et al. 2006). But there is also evidence that online communities are not purely transient collections of casual foragers, and that most survive because some individuals return repeatedly and invest energy in the ongoing conversation (Bagozzi and Dholakia 2002, Lee and Cole 2003).

In a social environment characterized by choice and low switching costs, why would some individuals choose to repeatedly participate in a particular discussion community? Furthermore, why would some individuals choose to invest additional time and energy in behaviors—such as contributing content or helping to moderate discussions—that are necessary to keep the community’s conversations going? A review of the online community literature reveals a range of explanations for why individuals participate in online communities in general. Some explanations highlight the benefits individuals receive from a community, such as access to expert advice (Lampel and Bhalla 2007), insights into others’ beliefs and opinions (Herring 1996), enhanced reputation (Lakhani and von Hippel 2003), additional professional contacts (Christensen and Raynor 2003), improved professional status (Hall and Graham 2004, Lerner and Tirole 2002), a more positive self-image (Constant et al. 1994), and greater confidence in their own knowledge (Wasko and Faraj 2000). Other explanations focus more on helping others, such as a desire to help build a community (e.g., Blanchard and Markus 2004), contributing to collective goals (Constant et al. 1994, 1996), ensuring the continued existence of the community (Wasko and Faraj 2000), feelings of camaraderie (Hall and Graham 2004), reciprocity (Constant et al. 1994, Wasko and Faraj 2005), altruism (Lakhani and von Hippel 2003), and even empathy (Preece 1999, Preece and Ghazati 1998). These kinds of motivators are often offered up as competing explanations for why individuals participate in online communities in general (e.g., Wasko and Faraj 2000). But because an individual may behave very differently in different communities (Jones et al. 2004, Joyce and Kraut 2006), we seek to answer these questions by using a theoretical approach that considers both the individual and the community. Our approach draws on organizational commitment research (Meyer and Allen 1997), which has sought to provide locally situated explanations for why individuals engage in certain behaviors based on the psychological bonds they develop to their organizations. We hypothesize that analogous forms of community commitment differentially affect specific types of member behaviors in an online community, thereby advancing the literature beyond merely predicting whether individuals participate by explaining

key differences in how members actually behave. This commitment-based approach also helps to address the practical needs of corporate managers and community developers who care about why members engage in particular activities in *their* community, not why they participate in online discussions in general (Kim 2000, Preece 2000).

2. Theoretical Background: Commitment Theory

A central focus of research in organizational behavior has been to provide theories of organizational membership—that is, examining individuals’ enduring desire to be part of an organization (Mowday 1998). One mature body of research has sought to understand how the psychological bonds that arise between employees and organizations influence workplace behaviors (Cohen 2003). Commitment has been generally described as a psychological bond that “stabilizes individual behavior under circumstances where the individual would otherwise be tempted to change that behavior” (Brickman 1987, p. 2). More specifically, organizational commitment is a psychological bond that characterizes an individual’s relationship with an organization (Meyer and Allen 1991, p. 67). Early on, commitment researchers typically pursued different conceptualizations of psychological attachment, including employees’ sense of dependence on the organization, their feelings of attachment to the organization, and their sense of obligation to the organization (e.g., Mathieu and Zajac 1990). In their seminal work, Meyer and Allen (1991) converged on the now widely accepted three-part conceptualization, theorizing that organizational commitment is a multi-dimensional construct consisting of three components: continuance, affective, and normative commitment.

In the organizational context, these three types of commitment have been broadly accepted as powerful predictors of job-related outcomes (Meyer and Herscovitch 2001, Meyer et al. 2002). However, each has a unique pattern of associations with different employee attitudes and behaviors, including job performance (Somers and Birnbaum 1998), citizenship behaviors (Organ and Ryan 1995), and absenteeism (Somers 1995). Continuance commitment leads employees to focus their efforts on preserving the employment relationship for their own benefit (Becker 1960); they do what they must to maintain their position with the organization, and little else, because they need something that is a result of their involvement (i.e., status, influence, compensation). For example, in a recent meta-analysis (Meyer et al. 2002), continuance commitment was found to be the only form of commitment that was negatively correlated with perceptions of interactional

justice and supervisor support, and the only one to negatively predict job performance. Affective commitment, on the other hand, is based on an emotional attachment to the organization, which leads employees to act in ways that further the organization's interests (Meyer and Herscovitch 2001). The same meta-analysis noted above shows that affective commitment was the only form that was positively correlated with supervisor satisfaction, and it uniquely predicted both absenteeism and job performance. Finally, employees who have a strong normative commitment feel an obligation to contribute to the goals and mission of the organization, which makes them more likely to engage in discretionary, nonmandated behaviors, such as organizational citizenship behaviors, because they feel that it is "the right thing to do" (Wiener 1982). Although each form of commitment has a different theoretical rationale, they are not mutually exclusive; indeed, employees can simultaneously possess different levels of each type (Meyer et al. 2002).

Though commonly applied to employment relationships in the management literature, commitment research originally sought to explain why volunteers at nonprofit organizations varied in their level of dedication (Becker 1960), making it a particularly appropriate theory base for understanding individuals' voluntary behavior in online communities. Community members are not employees, but both have considerable discretion in their level of engagement and the specific behaviors they choose to emphasize; an individual's commitment to a community might therefore be expected to affect his or her online behaviors (Wasko and Faraj 2005). However, while employee-employer relationships and member-community relationships are both fundamentally volitional in nature, the differences between them (e.g., de Souza and Preece 2004, Herrmann et al. 2004) suggest that each type of commitment will have analogous, but not identical, effects in online communities. Thus, while the basic logic of commitment theory—that an individual's particular mode of commitment will have unique effects in shaping his or her engagement and behavior—is expected to be consistent with the nature of online communities, the specific connections between constructs must be re-theorized for the online community context.

2.1. Types of Community Commitment

Continuance commitment has been defined as "an awareness of the costs associated with leaving an organization" (Meyer and Allen 1991, p. 67) and as "the degree to which an individual experiences a sense of being locked in place because of the high costs of leaving" (Jaros et al. 1993, p. 954). Here, costs include the loss of social and economic benefits that individuals believe are not available at other

organizations; continuance commitment leads individuals to remain with their organization because they feel a *need* for the unique benefits which they personally derive from that relationship (Meyer and Allen 1991). Sometimes termed "calculative" commitment (Swales 2002), this bond between individual and organization is driven by doubts that an alternate organization could provide the same level of benefits for the same effort invested (Meyer and Allen 1997). Continuance commitment is therefore a concept that is broadly applicable because, even in commitment theory, it does not depend on the nature of the organization, but rather on the extent to which an individual believes that he or she derives benefits from the relationship that are not available from other sources (Whitener and Walz 1993). In a community context, members invest time and energy and report receiving a range of informational and social benefits (Lakhani and von Hippel 2003, Ridings and Gefen 2004). Community members who value those benefits and doubt that they could obtain the same benefits elsewhere while incurring acceptable membership costs are thus likely to continue participating in ways that maximize those benefits (Butler 2001). We term this corresponding construct *Continuance Community Commitment* (Continuance CC) and define it as a bond between a member and a particular community that is based on the member's belief that his or her involvement provides net benefits that are not easily available elsewhere.

Affective commitment has been defined as "the employee's emotional attachment to, identification with, and involvement in the organization" (Meyer and Allen 1991, p. 67). Individuals with high levels of affective commitment like their organization and find their association with it to be emotionally fulfilling, independent of whether they necessarily like the particular activities that constitute their jobs. They tend to identify strongly with the employing firm (Rousseau 1998), share its goals and values (Griffeth et al. 2000), and feel as though they belong in the firm (Porter et al. 1974). Affective commitment may arise from social exchanges that lead employees to trust their employers (Cook and Wall 1980) and feel fairly treated by them (Riketta 2002). Similar affective bonds may also form between a member and an online community; evidence suggests that some community members may develop such feelings of attachment and identification with a community (Blanchard and Markus 2004) and may in turn come to feel a sense of belonging (Markus et al. 2000). *Affective Community Commitment* (Affective CC), therefore, is a bond between a member and a particular community that is based on the member's strong emotional attachment to that community.

Normative commitment is a third distinct form of organizational commitment that has been defined as “a feeling of obligation to continue employment” (Meyer and Allen 1991, p. 67) with an organization. Employees with a high level of normative commitment feel that they *ought* to remain with an organization, independent of whether or not they benefit directly from their activities there (Meyer and Allen 1991). Normative commitment may arise from employees internalizing the sense of loyalty (Wiener 1982) and obligation (Ashforth et al. 1998) held by their colleagues, or when employees experience a sense of indebtedness because they believe they have received benefits from their employer that they are unable to adequately reciprocate (Gouldner 1960). In a community context, members who have benefited from others’ friendship and advice may feel indebted to the community, feel a duty to remain members to repay the perceived debt (Lakhani and von Hippel 2003), and as a result have a sense of normative obligation towards the community (Rheingold 1993). *Normative Community Commitment* (Normative CC) is thus a bond between a member and a particular community that is based on the member’s sense of obligation towards that community.

3. Theory Development

By drawing on commitment theory, the range of competing explanations for participation offered in prior work can be understood as pieces of a more coherent framework that helps explain why individuals engage in different kinds of conversational behaviors online. To produce such a finer-grained model, we consider three key community behaviors identified in the literature: reading threads, posting replies, and moderating discussions (e.g., Constant et al. 1996, Lakhani and von Hippel 2003, Wasko and Faraj 2000). Because it entails consuming content posted by others, *reading threads* is a primary mechanism by which individuals obtain the direct informational and social benefits available from a community (Butler 2001, Welser et al. 2007). Individuals who *post replies* are contributing new information resources that help others (Lakhani and von Hippel 2003) and may also improve the posting individual’s status and reputation (Oreg and Nov 2008). Those who engage in *informal moderating behaviors* work to actively maintain and promote conversations in the community (e.g., Ahuja and Galvin 2003, Butler et al. 2007, Lampe and Resnick 2004) by guiding discussions towards collectively valued themes (Kollock and Smith 1996), managing disputes between users (Butler et al. 2007), and discouraging off-topic posts (Burnett and Bonnici 2003). Once participation is considered more precisely (Williams and

Cothrel 2000), it becomes clear that a single common set of antecedents is unlikely to have identical impacts across these three very different kinds of behaviors (Koh et al. 2007). In the following sections we hypothesize how each of the three kinds of bonds that may form between an individual and a community impacts a different behavior within that community. We do so by situating a range of motivators discussed in the online communities literature in the commitment framework described above.

3.1. Continuance Community Commitment

A range of studies have noted that behaviors in online communities are driven by members’ desire to maximize the value they obtain from a community (e.g., Furlong 1989, Ridings and Gefen 2004). This kind of motivation revolves around a member’s own needs and goals, and the effort required to obtain valuable information (Jones 1995). To obtain informational benefits from an online community, members read discussion threads (Welser et al. 2007). But reading takes time: adults typically read 200 words per minute (e.g., Saubramanian and Pardhan 2006). Add to this the extra requirement of navigation and search (Zhang and Watts 2008), and it becomes clear that reading threads is not effortless. Though there may be many explanations for why members are motivated to do so, one primary determinant is likely to be a member’s belief that the benefits of reading outweigh the costs (Butler et al. 2007). Continuance CC allows for the examination of such beliefs, by indicating the degree to which a member believes the cost/benefit ratio associated with one community is superior to that of other communities.

A member’s level of continuance CC is likely to affect his or her thread-reading behavior in several ways. First, a strong expectation that content will be valuable is likely to lead a member to be especially persistent in reading threads (e.g., Hsiu-Fen and Gwo-Guang 2006), even if he or she encounters low-quality content from time to time. While a member who has a low continuance CC might be discouraged when he or she encounters content that does not directly match his or her interests and expectations, a lack of fit is unlikely to deter a member who has a high level of continuance CC (at least in the short run). Such persistence may occur irrespective of actual content quality, as cognitive dissonance (Festinger 1957) would cause such a member to behave as though the community contained valuable, unique content—whether it actually did or not. This effect would not be expected in a member with a low level of continuance CC, who would be more likely to discontinue reading threads when faced with content that did not match his or her interests and needs (Butler 2001). Second, a member with

high continuance CC may believe that the social costs of leaving a community would be very high, particularly if he or she has invested considerable effort into the community in establishing an identity and learning the specific ways the community functions (Ma and Agarwal 2007). In conjunction with a perception of greater benefits, the costs associated with having to recreate an identity and learn the ways of a new community would lead such a member to spend more of their time consuming content in the community in which they have established themselves (versus another, new community). Together, these two theoretical paths (heightened persistence and sunk costs) suggest that members with high continuance CC will read more threads than those with low continuance CC.

HYPOTHESIS 1 (H1). A member's level of continuance CC towards a community will positively influence the number of threads he or she reads in that community.

3.2. Affective Community Commitment

Online community research provides a range of evidence to support the idea that individuals may form strong emotional attachments to a community (e.g., Greer 2000), with some members even reporting that they love their online community (Preece 1999). Members who have developed a strong affective bond towards an online community generally like that community and identify with it (Blanchard and Markus 2004), and are therefore more likely to want to be part of the conversations that occur in that community (Preece 1999). Because they find their association with it to be emotionally fulfilling, individuals with high levels of affective CC are likely to care very much about the community and how it is growing and evolving.

Individuals are generally more inclined to help those who are part of a group that they like and care about (Grant 2007), and so members who feel a strong emotional attachment to a community are more likely to help other members by replying to their posts. An affective attachment helps counteract cognitive processes that help humans conserve attention, but which can limit individuals' willingness to help strangers (Noddings 1984). Because of their sense of attachment and belonging, members who have a strong affective CC towards an online community are more apt to invest their time and effort helping others in the community by responding to their questions (e.g., Fisher et al. 2006, Wellman and Gulia 1999). Furthermore, members who identify strongly with a community care more about its central conversational topic or theme, and have a stronger desire to publicly demonstrate their solidarity with the community (Blanchard and Markus 2004, Ren et al. 2007) by contributing to the conversations that evolve in the community. Conversely, members with low affective CC

feel no particular bond or emotional connection with a community, are less invested in its long-term viability, and are thus less likely to care enough to reply to others' postings or explicitly be part of the community conversations.

HYPOTHESIS 2 (H2). A member's level of affective CC towards a community will positively influence the number of replies he or she posts in that community.

3.3. Normative Community Commitment

Some members of an online community feel a sense of indebtedness or loyalty towards the community (Ridings et al. 2006), which may appear to others as altruism (Wasko and Faraj 2000) or empathy (Preece 1999). Such feelings may arise when a member has benefitted from his or her association with a community and feels an obligation to repay the community, or because he or she believes strongly in the community. Underlying each of these motivations is an implicit normative argument, as some members believe that it is their duty to support the community (Constant et al. 1994, Wasko and Faraj 2005). Such members are likely to behave differently than those who lack the same sense of loyalty and/or indebtedness (Rheingold 1993). In particular, a member who feels bound to remain in a community because it is "the right thing to do" is more likely to act in selfless ways to sustain and even strengthen the community (Hall and Graham 2004). This sense of obligation may lead such a member to engage in behaviors that help the community, even if doing so incurs costs to the member that are not offset by any other direct benefits (Oreg and Nov 2008).

Members who have a strong normative commitment to a community are more likely to moderate discussions in that community (Kim 2000)—that is, to try to control negative behaviors and guide online discussions towards positive ends. Conceptually, informal moderating behaviors are related to the idea of community justice, which refers to the processes by which members of geographically bound communities take responsibility for self-policing and responding to crime via social control mechanisms that enhance community life (e.g., Sampson 1995). Community justice builds on the recognition that when citizens engage in civic activism, they discourage crime and steer would-be criminals towards socially appropriate behaviors. Proponents of community justice are more likely to appear among citizens who feel a strong sense of loyalty and social obligation towards their community (Clear and Karp 2000). Their sense of normative commitment leads them to take personal responsibility for preserving the viability of their physical community.

Similar processes are likely to occur in online communities (Kang et al. 2007). Members who have high

levels of normative CC are more likely to engage in leadership behaviors (Blanchard and Markus 2004), because they feel an obligation to do the right thing for their community. Believing that they have benefitted from their membership in the community, a form of generalized social exchange (Ekeh 1974) produces a sense of obligation that leads members to act in ways that repay the community as a whole. As a result, members with high normative CC are more likely to engage in behaviors that protect and enhance the community. By promoting constructive behaviors and discouraging disruptive ones, they help to maintain a sense of cohesion by defining what is acceptable behavior and what is not (Bergquist and Ljungberg 2001, Burnett and Bonnici 2003). Over time, informal moderating serves to both winnow out unproductive members and retain productive ones, socialize newcomers, and strengthen the community (Ahuja and Galvin 2003). Because they feel a bond of loyalty and obligation to the community, members who have high levels of normative CC are more likely to engage in behaviors that preserve the community.

HYPOTHESIS 3 (H3). *A member’s level of normative CC towards a community will positively influence the extent to which he or she engages in discussion moderating in that community.*

Though we hypothesize three relationships, one for each form of commitment and its distinctive impact on a particular community behavior, it is possible that each form of community commitment could impact other online behaviors. To control for the other possible relationships not hypothesized here, we include these other potential associations as controls in our model. Figure 1 therefore shows the three hypothesized relationships alongside all other paths that we

controlled for among independent variables, dependent variables, and other control variables described below.

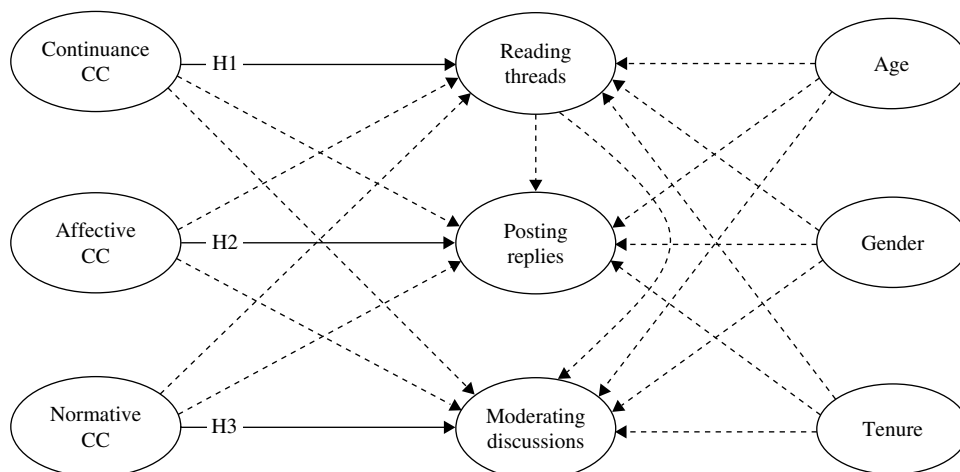
4. Research Methods

Data for testing our research model were collected at BroadForum (a pseudonym), an online discussion community that had approximately 50,000 registered members and 3.4 million posts during the prior 22 months of operation. BroadForum’s business model was based on revenue generated via paid advertising targeted at members. Built on a commercial thread-based bulletin board platform (vBulletin), it was promoted as a “general discussion” community, with topics including current events, sports, entertainment, fashion, politics, philosophy, technology, and anime, among many others. Members did not occupy any particular professional, technical, or cultural niche. As is common practice in the administration of online communities, the sheer size of the community and message volume led its manager to group discussion threads into categories to help members organize their conversations around topics of interest. However, BroadForum maintained its identity as a single online community, hosted by a single manager. We solicited subjects via an invitation message made in a new thread (as recommended by Andrews et al. 2003) that included a description of the project, an endorsement by the manager, and an invitation to complete an online survey in exchange for the chance to win a gift certificate from a popular online retailer. Follow-up postings were made on days 7 and 11, and data collection terminated on day 14.

4.1. Respondents

Our invitation was viewed 3,183 times over 14 days, although this tally does not distinguish between

Figure 1 Research Model



Note. Controls shown with dashed lines.

unique and repeat views. A total of 741 members accessed the survey site, meaning that at least 23.3% of those who viewed the invitation clicked through to the survey. Of these click-throughs, 324 (43.7%) subsequently went through the entire survey. A conservative estimate¹ is thus that at least 10.1% of potential respondents completed the survey (although this figure would increase if the invitation was viewed multiple times by the same individual). We deleted responses made by those under 18 years old and those with large amounts of missing data, resulting in a final data set of 192 adult members (ages ranged from 18 to 53, with a mean of 23.5). Tenure as a registered member ranged from six to 671 days, with a mean of 360 days and median of 390 days. Eighty-four percent of respondents were male. The largest proportion of respondents reported spending between two and four hours daily using the Internet and visiting online communities.

4.2. Measures

We developed our survey instrument following Dillman's (2000) approach. We adapted items from Meyer and Allen's (1997) organizational commitment scales to create community commitment equivalents, and items from Butler et al. (2007) to measure moderating behaviors. Items that measured continuance CC were analogous to organizational continuance commitment measures, focusing on key ideas that had meaning in both contexts, including individuals' perceptions of loss on departure, availability of viable alternatives, scarcity of similar benefits elsewhere, and perceptions of unique value. Items adapted to measure the community-oriented normative analogue focused on the idea of loyalty, obligation, guilt, and duty. Finally, items developed to measure affective community commitment used ideas of perceived group membership, emotional attachment, personal meaningfulness, and a sense of belonging, all present in the source scales. In each case, our goal was to capture the original theoretical concept as it would be expressed in an online community context. All items were further refined via a card sort procedure and a pilot study performed in three different online communities, with a total of 285 completed responses, and informal discussions with community managers and members. The final set of items is shown in Table 1.

¹ Following an established procedure for calculating response rates in surveys of online communities (Ridings et al. 2002) produced a response rate of 25.9% of individuals who accessed the survey site. While we know nothing about those who read the invitation but chose not to access the survey site, our ability to track how many times invitations were viewed and how many surveys were started and completed allowed us to calculate a reliable response rate, thereby providing better metrics than are typical in online data collection (Andrews et al. 2003).

Table 1 Survey Items

Continuance community commitment	
CC1 ^a	I am sure that there are other sites where I could find the same content and services that I get at this site. [r]
CC2 ^a	I keep coming to this site because there are few alternative sites available.
CC3	If I stopped coming to this site, it would take me a long time to find a site that could replace it.
CC4	There are very few other places where I could find the kind of useful content and services that I get from this site.
CC5	The content of this site is too valuable for me to stop visiting.
Normative community commitment	
NC1	I feel an obligation to continue visiting this site.
NC2	I would feel guilty if I stopped visiting the site now.
NC3 ^a	This site deserves my loyalty.
NC4	I keep coming to visit this site because I have a sense of obligation to it.
NC5	I visit this site partly out of a sense of duty.
Affective community commitment	
AC1	I feel like a part of the group at this site.
AC2	I have a real emotional attachment to this site.
AC3	This site has a great deal of personal meaning for me.
AC4	I feel a strong sense of belonging to this site.
AC5	I feel a strong connection to this site.
Moderating discussions	
MO1	I try to settle disputes between users.
MO2	I encourage users not to post messages that are off-topic (i.e., hijack) from the original thread.
MO3	I reprimand other users' inappropriate behavior.
Gender	What is your gender?
Age	What is your year of birth?

^aItems dropped from final analysis.

All attitudinal items were measured on Likert scales anchored on "1 = strongly disagree" and "7 = strongly agree."

We gathered archival data from BroadForum's server logs for 16 weeks after the completion of the survey: the number of threads read and the number of replies posted over this period. The archival measure of threads read is the summation of the number of threads displayed on each member's monitor over those 16 weeks, while the measure of replies posted is the summation of the number of times a member responded to another's post over the same 16-week period. While not all members were active during each of those 16 weeks, summing responses over this period produces variables that reflect longer-term tendencies, rather than being confounded by short-term bursts of activity. These archival data were skewed, as is typical in community behavior data (Butler 2001, Jones et al. 2004); we therefore calculated the logarithm of each archival variable to increase the normality of the data by collapsing the distance between the values in the long tail of the distribution (a long tail is common in studies of online community

Table 2 Means, Standard Deviations, and Correlations ($n = 193$)

	Response mean	Std. dev.	Composite reliability	AVE	1	2	3	4	5	6	7	8	9
1 Gender	0.84	n.a.	n.a.	n.a.	n.a.								
2 Age	23.5	7.4	n.a.	n.a.	-0.39**	n.a.							
3 Tenure (days)	360	209	n.a.	n.a.	0.33**	-0.17*	n.a.						
4 Continuance CC	5.13	1.42	0.89	0.73	-0.08	0.04	0.02	0.85^b					
5 Normative CC	3.50	1.64	0.93	0.78	0.01	-0.01	0.09	0.30**	0.88				
6 Affective CC	4.70	1.40	0.94	0.76	0.01	-0.03	0.13	0.51**	0.52**	0.87			
7 Reading threads ^a	1,694	1,708	n.a.	n.a.	0.40**	-0.27**	0.34**	0.17*	0.04	0.17*	n.a.		
8 Posting replies ^a	471	1,570	n.a.	n.a.	0.30**	-0.21*	0.15	0.18*	0.09	0.24**	0.81**	n.a.	
9 Moderating discussions	4.42	1.43	0.88	0.71	-0.12	0.04	-0.04	0.24**	0.35**	0.47**	0.14	0.22*	0.84

^aMeans and standard deviations for these variables are reported for raw variables; correlations are reported for logged versions of archival variables.

^bDiagonal elements are the square root of average variance extracted.

* $p < 0.05$; ** $p < 0.01$ (two-tailed tests).

phenomena). We also gathered demographic data—gender (1 = male, 0 = female), age (years), and tenure (days)—and included these variables as controls in our models.

The data were employed in a simultaneous test of structural and measurement models using Partial Least Squares (PLS Graph, version 3.00). In addition to modeling the hypothesized relationships and controlling for other nonhypothesized relationships and variables shown in Figure 1, we also controlled for the possibility that replying and moderating behaviors would be a direct function of reading—that is, individuals who read more threads might reply or moderate more simply because of their larger volume of reading. By controlling for this effect, we were able to more precisely examine the proportion of variance in replying or moderating that was a function of community commitments. We assessed the adequacy of the measurement model using three common tests of convergent validity (Chin 1998). First, after dropping three items that loaded poorly (CC1, CC2, and NC3), all loadings of the remaining items on their intended constructs were greater than 0.7. Second, we assessed the internal consistency of each construct using composite reliability and found the lowest to be 0.88. Third, we calculated the average variance extracted for each scale; all scales exceeded Chin's (1998) guideline of 0.5, meaning that at least 50% of the variance in indicators was accounted for by its respective construct. Table 2 provides the results of these measurement model analyses. To assess discriminant validity, we also conducted an exploratory factor analysis and examined the correlations of items and constructs and found that none of the cross-loadings exceeded 0.35. We also noted that the square root of AVE for each construct (see Table 2) exceeded all respective inter-construct correlations, providing further evidence of discriminant validity.

4.3. Data Analysis and Results

We tested our hypotheses by examining the size and significance² of structural paths in the PLS analysis, with all significant paths shown in Figure 2.

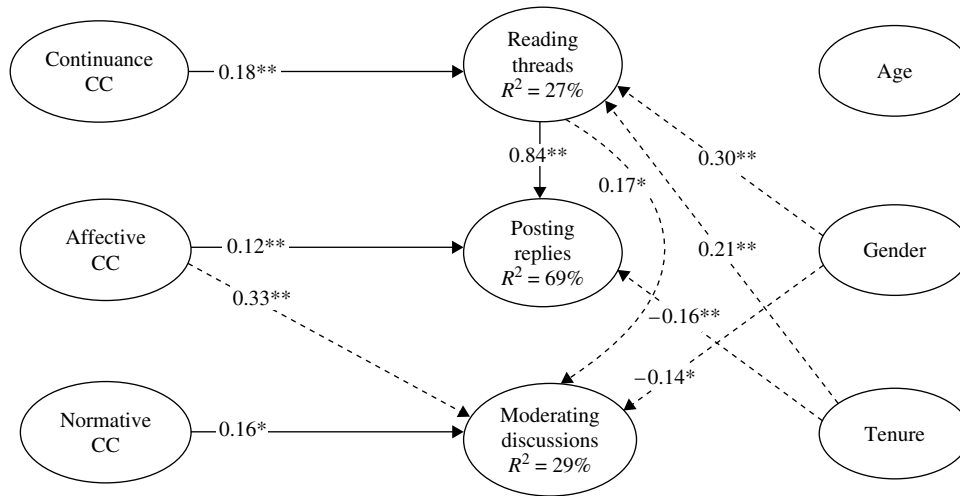
The analysis revealed that only continuance CC significantly predicted thread-reading behavior (H1, $\beta = 0.18$, $p < 0.01$). The model also shows that affective CC was the only form of commitment that significantly predicted reply-posting behavior (H2, $\beta = 0.11$, $p < 0.05$). Finally, the PLS analysis indicates that normative CC (H3, $\beta = 0.16$, $p < 0.05$) significantly predicted discussion-moderating behavior, and that (though not hypothesized) affective CC ($\beta = 0.33$, $p < 0.01$) also significantly impacted moderating behavior. Other control variables were also significantly associated with different online behaviors. Thread reading significantly predicted reply-posting ($\beta = 0.84$, $p < 0.01$) and discussion-moderating behavior ($\beta = 0.17$, $p < 0.05$). Gender significantly predicted threads read ($\beta = 0.30$, $p < 0.01$) and negatively predicted discussion-moderating behavior ($\beta = -0.14$, $p < 0.05$). Tenure significantly predicted thread reading ($\beta = 0.21$, $p < 0.01$), and negatively predicted reply posting ($\beta = -0.16$, $p < 0.01$). Age did not significantly influence any behavior. Beta coefficients for the full set of paths tested in our model, including nonsignificant relationships, are provided in Table 3.

5. Discussion and Implications

The online communities literature features a range of sometimes contradictory claims about different factors that are thought to motivate online participation in general (e.g., Blanchard and Markus 2004, Lakhani and von Hippel 2003, Wasko and Faraj 2000).

²PLS produces standardized regression coefficients for structural paths. Bootstrapping techniques, a nonparametric approach for estimating the precision of paths, were used to test for significance using 500 resamples.

Figure 2 Results of PLS Analysis



Note. Significant paths only: $p < 0.05$ (*) and $p < 0.01$ (**).

By adopting a commitment framework, we demonstrate the utility of conceptualizing these in a more systematic fashion as member-community bonds that predict specific discussion behaviors. Our results confirm that each form of community commitment has unique explanatory power and is not interchangeable with others in nature, scope, or impact. This research may help community managers to better target their member development and retention efforts towards producing the kinds of bonds that will keep the community active, focused, and evolving. Below, we elaborate on these contributions to research and practice.

5.1. Implications for Research

This study advances online community research by offering a coherent model of member-community commitments and their differential behavioral effects. Consistent with commitment theory, all three kinds of member-community bonds can operate simultaneously in a community setting and produce different kinds of behavioral outcomes. This provides a new baseline on which future research can build more powerful and precise theoretical models of engagement in online communities.

First, the connection between continuance CC and thread-reading behavior confirms the very focused outcomes of members' sense of instrumental dependence on an online community. While continuance

commitment in an organizational setting sometimes leads individuals to engage in fewer noninstrumental behaviors, our data did not support such an effect in a community setting. The fact that continuance CC did not affect replies or informal moderation provides evidence that only those online behaviors that provide the most direct benefits are motivated by members' belief that they rely on the community for the unique value it creates. Although organizational continuance commitment is often seen as undesirable (Meyer and Allen 1997), our results suggest that continuance CC is not a bad thing. Despite the fact that members who only consume content are sometimes characterized as free riders (Kollock and Smith 1996), continuance CC seems to produce members who try harder to maximize the unique benefits of the community for themselves personally and thus form an audience that may attract content providers, which is key to community growth (Butler 2001). Differences in how benefits are allocated may explain these different effects: In an organizational context, status, influence, and income are often relatively insensitive to variation in employees' effort level (at least in the short run), while online communities produce immediate benefits in direct proportion to effort invested. Organizational commitment researchers therefore may seek to build on these findings by investigating whether compensation style or the ability to adapt jobs to individual needs significantly moderates the negative effects of continuance commitment in the workplace.

Second, the impact of affective CC on replies posted attests to the importance of emotional attachment and identification in online communities. Members' affective CC seems to lead them to want to help others who are part of their community by engaging in conversation with them. The development of affective CC in members may therefore be an important step that

Table 3 All Path Coefficients

	Continuance CC	Affective CC	Normative CC	Reading threads	Age	Gender	Tenure
Reading threads	0.18**	0.08	-0.08		-0.12	0.30**	0.21**
Posting replies	-0.03	0.12**	0.02	0.84**	0.00	0.01	-0.16**
Moderating discussions	0.09	0.33**	0.16*	0.17*	0.02	-0.14*	-0.10

* $p < 0.05$; ** $p < 0.01$ (two-tailed tests).

not only engages members in a community's activities more deeply, but also helps ensure the long-term success of the community by making it more likely that questions will receive responses (Arguello et al. 2006). One unexpected finding was the powerful effect of affective CC on informal moderating behaviors. A potential explanation for this may be that whatever the specific characteristics that produce an affective bond—and these are likely to vary from group to group—members who have strong affective bonds to a community may be more likely to engage in behaviors that contribute to maintaining those characteristics over time (Ren et al. 2007). Because these characteristics are often perpetuated through social structures, members who seek to sustain the desirable aspects of a community are likely to voluntarily engage in behaviors that reinforce such community goals, values, and social structure (Kim 2000). As such, the emotional connection that leads them to identify with the community and hold its values and goals as important may lead them to be more willing to act in relatively selfless ways to help sustain those values by acting as an informal group moderator. However, our results show that affective CC did not lead members to read more threads—possibly because of a plateau effect or because members who have a strong affective CC express their bond by investing more effort into the conversations that they are already part of, rather than seeking out new conversations. Overall, members who have a strong affective attachment to a community engage in a broader range of community-focused behaviors than originally anticipated as a result of their identification and attachment with the community.

Third, while the impact of normative CC on moderating behaviors was supported, its impact was weaker than the literature on reciprocity and altruism in online contexts sometimes implies (e.g., Constant et al. 1994), as normative CC was a weaker predictor of moderating behaviors than was affective CC. Furthermore, normative CC did not significantly predict thread-reading or reply-posting behaviors. Taken together, this calls into question arguments such as those offered by Preece (1999) and Wasko and Faraj (2000) that generalized that reciprocity and a sense of obligation are primary drivers of online community behaviors. Methodological variation may be partly to blame for these differences: Studies often differ with respect to the entity that is the target of an individual's sense of obligation (another individual versus a specific group or community versus generalized altruism or reciprocity without a focus). Although our results provide some support for the presence of a generalized sense of indebtedness and obligation that affects informal moderator behaviors, it also suggests

important future challenges in reconciling the different foci of obligations that may exist in online communities. In particular, the strong impact of affective CC on moderating behaviors suggests that emotional attachment may account for at least some of what other studies have attributed to obligation.

The integrative theoretical approach developed in this work also provides guidance for scholars interested in modeling online communities. Prior studies have tended to treat theories of need, affect, and obligation as competing explanations for behaviors in online communities. For example, an exploratory study by Wasko and Faraj (2000) asked members of an online community why they participated in it, and respondents gave a wide range of reasons (including anticipated benefits, enjoyment, and moral obligation, among others). However, Wasko and Faraj saw these as alternate explanations for participating in online communities generally, and, based on the strength of the responses they gathered, concluded that a variety of individually held beliefs about moral obligation were the most important factors in explaining online behaviors. Our study takes a key step forward by advancing a comprehensive set of member-community bonds based on a well-established parallel literature, theorizing the unique impacts of these bonds, and documenting the specific kinds of bonds that lead members to perform specific behaviors. In a subsequent study, Wasko and Faraj (2005) posited that individuals who were more committed to a professional network of practice would contribute more knowledge. However, their operationalization of commitment attempted to combine aspects of affective, normative, and continuance logic into one measure, which ultimately failed to support their hypotheses. By fully elaborating the community versions of each commitment construct, our research provides a plausible explanation for Wasko and Faraj's lack of significant findings. Rather than finding that commitment has no effect on members' behavior, our more precise model in fact reveals that it has a rich array of effects. Researchers who might have discarded the commitment construct as unimportant should reconsider this important set of ideas when developing models of online behaviors and their antecedents. Our results suggest that any attempt to explain online behaviors will be incomplete unless it considers all three forms of commitment.

Future research that examines the synergistic impacts of different levels of each kind of commitment in a community (for instance, via simulation techniques) could go far in illuminating the dynamic process of community formation. Because we were not able to observe how different forms of community commitment developed over time, a variety of

interesting questions remain about their nature and evolution. First, is there a typical temporal sequence in the evolution of a member's community commitments? For instance, does an initial period of continuance CC, with its individually focused style, act as a mechanism to keep new members coming back, possibly leading to the development of greater affective CC and its associated helping behaviors later? If so, how does normative CC fit into the evolution of member commitments? Second, how do interactions between groups of people characterized by these different kinds of commitments contribute to the operation of a community as a functioning whole? In particular, there seem to be parallels between the commitment/behavior patterns observed in our findings and the core-periphery structure that is often discussed in the context of online communities (e.g., Kim 2000). There are clearly some intriguing possibilities for building new connections between social network and social psychological approaches to online behavior, where individual-level insights may complement network-level findings to produce a more integrated, multilevel theory of community activity and dynamics.

Control variables in our model also suggest some interesting avenues for future research. First, in our sample, men were much more likely to read threads, while women were more likely to moderate discussions. This stands in contrast to research that finds, for example, that men and women are equally likely to both lurk and post (Preece 2004), but is consistent with other research demonstrating that men and women communicate differently online (Gefen and Ridings 2005). Second, our results suggest that members with longer tenure are more likely to read but less likely to reply to threads. Claims that longer-tenure members are more likely to take on leadership roles (Kim 2000) may be confusing tenure with commitment; our findings suggest that it is the form of attachment that counts, not merely the length of tenure.

Looking forward, a natural extension to this study would be to examine the factors that influence how new members, as they are socialized into an online community, form various kinds of commitments. The organizational commitment literature suggests a broad range of antecedents to each form of commitment, some of which may also apply in community settings (e.g., shared values, trust, supportiveness). It is also possible that certain desires and goals expressed by members, such as enhancing one's reputation or increasing one's power and authority in the community, could affect individuals' commitment levels. Additionally, other impacts of each form of commitment (e.g., satisfaction, intention to leave) could be examined to build a more complete nomological network.

5.2. Implications for Community Managers

Our results highlight a complex problem faced by community managers: how to encourage members to engage in the various behaviors that are key to community viability. Building affective CC is clearly important, but such relationships may be more difficult to develop, especially on a large scale. Members primarily motivated by continuance CC are also important, because they serve as an audience and are probably easier to attract. However, they are less likely to give back to the community, as their behaviors are driven by their own needs. Their value might not be immediately apparent, but managers who can appreciate them as part of the diversity necessary to keep a healthy community growing are likely to do a better job of ensuring that the community does not become too introspective and exclusionary. Instead of trying to understand the "ideal" or "average" community member—as much past research has done—our results suggest that managers should appreciate the range of psychological bonds that members may experience. It may not be necessary to encourage each member to engage in all the major behaviors that keep a community functioning; instead, managers may be able to stimulate desired behaviors by nurturing the associated underlying psychological bonds. Although we did not investigate community commitment antecedents, we describe some potentially valuable interventions below.

Managers who seek to expand their audience could enhance members' perceptions of the unique value of the community. This could begin with a survey or focus group, or with an analysis of topic popularity to identify the kind of content that is uniquely valuable to the member base; doing so might help managers reposition a community towards the types of valuable content that are not available elsewhere. Managers might then create new discussion areas, solicit targeted contributions to stimulate conversations, or seed controversial discussions to encourage postings on high-value topics. Managers could also communicate with members to ensure that all are aware of the unique benefits available, for instance by posting short examples of high-value content not available elsewhere, or by retelling stories of members who benefitted greatly from community content. Such efforts are likely to increase continuance CC and positively influence thread-reading behavior.

Managers who want to create more in-depth discussion by increasing reply-posting behavior may target members' levels of affective CC. For example, if a community has a diffuse or unfocused identity, it may be difficult for members to identify strongly with it. Any effort a manager can make towards creating a clear and consistent community identity (common values, interests, or goals) is likely to increase

affective CC in members who see parallels between the group's identity and their own, which will in turn encourage reply-posting behavior. Alternately, affective bonds are likely to be enhanced when members feel they are supported and treated fairly and trust the community manager. A range of initiatives to encourage mutual respect and accountability could therefore enhance affective CC and subsequent reply-posting behavior.

Finally, managers who wish to encourage informal moderating behaviors have two options for doing so—namely, via affective CC and via normative CC. Members' affective bonds seemed to have a greater effect on informal moderating than did their sense of obligation. This suggests that attempts to promote moderating may be more effective when accomplished through indirect approaches—for instance, by building members' sense of identification with the community, as described above. However, managers who wish to enhance normative CC might undertake communications that stress the underlying “rightness” of the community's cause, or highlight stories of members who displayed loyalty and who are greatly respected as a result. Initiatives such as these, which may increase normative CC, are likely to increase informal moderating behaviors.

5.3. Limitations

As with any empirical study, this work is subject to limitations, the first of which has to do with methodology. Two of our three dependent variables were archival data, and one was self-reported; the results for H3 are therefore subject to the typical limitations of cross-sectional, survey-based research. More generally, the fact that our data came from a single community (albeit a general interest community) limits the generalizability of our results, a matter that can only be addressed through replication. Similarly, our sample was made up of self-selected respondents—we only have data on members who chose to read our invitation and complete the survey. Thus, the sample may not be representative of all community members, and may underrepresent those individuals who do not read much content. As such, our sample may be biased towards members who were highly committed. However, because respondents vary significantly in their commitment scores, online behaviors, and tenure, it seems unlikely that our findings are purely the result of such bias. Although it is not inconsistent with our focus on explaining why individuals return over time to a community, the possibility of self-selection bias makes it more likely that our findings would apply to members who are regular visitors, and less likely that they would apply to members who have visited only a single time, or who visit very infrequently. A final potential limitation

concerns researchers' ability to compare our results concerning reply-posting behavior with other published studies of message posting in general. Because we do not hypothesize or test determinants of posting in general but rather focus on a very specific type of posting (replying), our findings may not be directly comparable to prior studies of more general posting behaviors. We see this as a necessary by-product of our efforts to help online community research become more specific in what it models. The increasing theoretical precision that comes from being able to conceptualize replying as a more specific behavior makes it worthwhile for us to pursue this approach over a general and undifferentiated “posting” variable, at the cost of direct comparability.

5.4. Conclusion

Does the kind of commitment that a member develops towards an online community affect his or her behaviors? Our research suggests that the three established forms of organizational commitment provide an important integrating framework for understanding these bonds and their distinct behavioral outcomes. By theorizing the community-specific outcomes of affective, normative, and continuance CC, this work provides a more coherent perspective on online communities as interlocking sets of behaviors and commitments that together support long-term community viability. As such, this research provides a basis for locally situated models of member behaviors that will help managers enhance their communities and offer researchers a foundation for future efforts to refine our understanding of members' behaviors in online communities.

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