SOCIAL DYNAMICS WITHIN ELECTRONIC NETWORKS OF PRACTICE

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAI‘I AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

INTERNATIONAL MANAGEMENT

MAY 2013

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Keywords: electronic networks of practice, habitus, fields, forms of capital, peer-to-peer feedback systems, third places, culture in interaction, group style
AKNOWLEDGEMENTS

My work on this dissertation has been supported by many people. I would like to first thank my family for being patient and supportive while I was working on this research project. I would also like to thank Dr. Davidson for guiding me along the process, especially during the times when my motivation was lagging and progress was slow. I am also tremendously grateful to my dissertation committee for providing me with many insightful comments that challenged me to think critically about many different aspects of this research project. I would also like to thank Sal Aurigemma and Ina Sebastian for taking time out of their busy schedules to help me systematically code my data. Finally, I would like to acknowledge the support that the Shidler College of Business has given me throughout this process.
ABSTRACT

Electronic networks of practice (eNoP) are special types of electronic social structures focused on discussing domain-specific problems related to a skill-based craft or profession in question and answer style forums. eNoP have implemented peer-to-peer feedback systems in order to motivate future contributions and to distinguish contribution quality. However, there is a lack of empirical data or a set of theoretical perspectives in the literature to evaluate their effectiveness against these claims. The purpose of this dissertation is to develop and empirically test two related theoretical perspectives concerning voting practices within these systems and the usefulness that these systems have in terms of promoting future contributions. I do this by performing two independent (but related) empirical studies.

In the first study, I qualitatively demonstrate that the off-topic forums within eNoP have the potential to be virtual third places, special types of informal gathering places. I then quantitatively demonstrate that members who have greater affective place attachment to the third place portions of the network and members who make identity claims with the eNoP through their third place participation have a higher propensity of contributing a positively rated practice-related contribution and a lower propensity of becoming inactive on the practice side of the eNoP. I further demonstrate empirically that the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related contributions is qualified by third place participation, most notably site level identity claims made by third place participants. I argue that this is the case, because status attainment and maintenance in a place of emotional and psychological significance is more important than status attainment and maintenance in ‘just another’ knowledge sharing eNoP.
In the second study, I utilize a cultural sociology perspective drawing primarily from Bourdieu’s integrated social theory (fields, forms of capital and habitus) and Eliasoph and Lichterman’s concept of culture in interaction in order to explain voting practices within peer-to-peer feedback systems. In this study, I argue that a vote is a complex social and cultural phenomenon that is based on more than the quality of the post. I demonstrate empirically that the lower the social class of the giver and receiver of feedback, the greater the differences in professional habitus between the giver and the receiver of feedback, and members who violate the group style have a higher propensity of receiving negative votes (as opposed to positive votes). My results further reveal that the effect of small professional habitus differences is amplified in the presence of a group style violation, specifically group bond violations. These results hold even after controlling for the quality of the post and previous interaction histories between dyadic pairs of members.

This dissertation advances the knowledge of social dynamics within eNoP by complementing existing eNoP literature, which explains interactions and knowledge contributions largely in terms of networking constructs such as network centrality and network density using market-based ties and traditional resource exchange perspectives. My research demonstrates that eNoP are much broader than resource exchange systems and may be more appropriately conceptualized as social and cultural systems. Concepts of place, social stratification, habitus, and cultural in interaction provide eNoP researchers an enhanced theoretical toolkit for explaining and predicting the social interactions within these electronic social structures. This dissertation also has practical ramifications for eNoP site designers and the designers of peer-to-peer feedback systems more generally.
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CHAPTER 1. Introduction and Research Motivation

Organizations are becoming increasingly more distributed due to internationalization, outsourcing, and process reengineering efforts that have been happening for the past several decades (Drucker, 1999). These factors along with rapid advances in information communication technologies have resulted in the need for employees to make use of informal networks both within and outside of organizational boundaries in order to efficiently and effectively complete job-related tasks (Brown & Duguid, 2000; Chesbrough, 2006; Cross, Borgatti, & Parker, 2002). More and more, employees are leveraging virtual knowledge networks to fulfill these needs. These so-called electronic networks of practice (eNoP) are special types of electronic social structures focused on discussing domain-specific problems related to a skill-based craft or profession in question and answer style forums; eNoP typically contain members from multiple organizations or members who are only loosely connected with each other (Brown & Duguid, 2000; McLure Wasko & Faraj, 2005; Vaast & Walsham, 2009).

Employees also have the potential problems of isolationism and loneliness resulting from distributed work environments and the lack of face-to-face human interaction associated with these organizational forms (Lai & Burchell, 2008; Yilmaz, 2008). Many eNoP seemingly recognize this problem and are expanding their repertoire of forums to include off-topic spaces of interaction such as tangentially related blogs, off-topic message forums, Facebook style profile pages, and personal introductory message forums into their design. Discussing practice-related problems concerning the skill-based craft or profession may be the initial reason why the eNoP develops, but typical networks now include a mix of practices and spaces of interaction whereby the spread of knowledge, information and advice is coupled with general sociability in order to increase the attachment that members have with the eNoP as a place and to strengthen
the ties between members (Ridings & Gefen, 2004). Off-topic social interactions such as sharing pictures, discussing personal matters, or having impromptu discussions on current affairs or sporting events may be important mechanisms through which members may derive social value from participation above and beyond the learning value associated with membership (Ren, Kraut, & Kiesler, 2007; Ridings & Wasko, 2010).

Two main problems with eNoP are: (1) motivating participants to contribute content and (2) separating high quality contributions from low quality contributions. First, eNoP typically rely on the “wisdom of the crowd” and the “kindness of strangers” in order to spread knowledge, information and advice throughout the network (Constant, Sproull, & Kiesler, 1996; McLure Wasko & Faraj, 2005; Whelan, 2007). Particularly in large networks, there is an economic incentive to free-ride (i.e. consume knowledge without contributing any). In light of this incentive, much of the research on eNoP and related electronic social structures has investigated why individuals contribute to the public good in terms of individual intrinsic motivators such as altruism and general enjoyment (Constant, et al., 1996; Sproull, Conley, & Moon, 2005), individual extrinsic motivators such as reputation, status and recognition (Lampel & Bhalla, 2007; Lerner & Tirole, 2002), and community motivators such as generalized reciprocity, commitment and the sense of community (Bateman, Gray, & Butler, 2006; Blanchard & Markus, 2004; Cummings, Sproull, & Kiesler, 2002; Ren, et al., 2007; Ren, Kraut, Kiesler, & Resnick, 2012).

Second, eNoP are generally open networks with minimal barriers to entry, meaning anybody with an interest in a specific topic area may join simply by creating a profile (McLure Wasko & Faraj, 2005). Consequently, any member may answer a given question, whether that member is an expert or knowledgeable in the particular topic area or not. Therefore, determining quality
when there may be significant uncertainty and variability within a given eNoP is particularly problematic, especially in environments when the consequences of acting on bad advice are high. For example, there may be serious negative ramifications for acting on bad medical advice or negative consequences for downloading ‘code fixes’ that may contain malware or other malicious content along with the fix. In these types of environments, a trial and error approach to determining quality within an eNoP may not be an effective strategy.

A means to address both of these problems is through the implementation of peer-to-peer feedback systems, which many eNoP have already done in some form (Crowston, Wei, Howison, & Wiggins, 2012; Kollock, 1999; Preece & Schneiderman, 2009). These systems generally allow members to provide feedback on other members typically in the form of positive and negative votes related to specific posts, and the net votes (sum of total positive votes minus sum of total negative votes) that a member has received within these systems are usually displayed next to all posting activity. Beyond the conceptual claims of the importance of these peer-to-peer feedback systems, however, there is a lack of qualitative and quantitative data or set of theoretical perspectives in the literature to evaluate their effectiveness. The purpose of this dissertation is to develop and empirically test two related theoretical perspectives concerning claims that peer-to-peer feedback systems promote future contributions and are mechanisms to distinguish contribution quality such that the membership gets socially stratified primarily based on the quality of their contributions. The two general research questions addressed in this dissertation are the following:

**RQ1**: Does off-topic participation impact future practice-related participation and the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related participation?

**RQ2**: How are eNoP members using the peer-to-peer feedback system in terms of giving and receiving positive and negative votes?
In order to address these research questions, I conducted two independent (but related) empirical studies investigating social interactions within a large eNoP of software developers, which is referred to as TPC (pseudonym) in the remainder of the dissertation. A pseudonym was used in order to protect the site’s members and the site itself from any analysis that may hurt the competitive position of TPC relative to other eNoP in the software development industry (see Appendix A for the Institutional Review Board Approval).

**Research Setting**

TPC has been in existence since 2001 and has over 525K registered members as of April 2011. The site contains both formal message boards where domain specific problems are discussed (on-topic forums) in question and answer formats as well as places where members may informally discuss non-programming and non-IT related topics such as sports, current events or politics (off-topic forums). The on-topic sections contain question and answer forums in a variety of programming languages ranging from scripting languages such as Perl and PHP to object oriented languages such as Java and C++. The off-topic forum referred to as the TPC café (pseudonym) is the setting for the first empirical study. The site describes the TPC café as a “forum for discussions related to non-programming topics including: sports, current events, games, music, movies, TV, food, drink, geek related (toys & technology), debates, life events, rants, and occasionally religion and politics.” In December 2010, roughly 30% of all posts across all forums on the site came from the TPC café, so this is a very popular ‘hangout’ place for TPC members.

The site also has a forum where members may discuss technology industry related news and events not directly related to programming but not completely off-topic either. Topics such as enterprise applications, new technology product announcements, technology consulting, and
other IT topics are discussed in this forum. This forum is a general discussion forum, which is not organized in a question and answer format like the programming forums. This forum is referred to as the TPC Cubicle (pseudonym) and is the setting for the second empirical study. In December 2010, roughly 3% of all posts across all forums at the site came from the TPC Cubicle. Table 1 shows the different types of forums at TPC and some other general site information.
### Table 1. TPC Site Details

<table>
<thead>
<tr>
<th>Details</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>TPC was formed in 2001</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>TPC has over 525K members as of April 2011 but only a fraction those registered members are active at any point in time. There have been over 190K unique threads with over 1.25 million responses to those threads at TPC as of April 2011.</td>
</tr>
<tr>
<td><strong>Peer-to-Peer Feedback System</strong></td>
<td>Voting is done in a binary manner (either positive (up) or negative (down)). Each member’s score (sum of total positive votes minus sum of total negative votes) is visibly displayed next to all posting activity.</td>
</tr>
<tr>
<td><strong>Programming Related Forums (On-topic)</strong></td>
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</table>
TPC was selected as the eNoP to study in both empirical essays for several reasons. First, it has an extremely rich and transparent peer-to-peer feedback system whereby any member or guest may view the date, the post, and the members who received and gave the positive or negative rating (vote). In this system, voting is done in a binary manner (either positive (up) or negative (down)) and a member’s score (sum of total positive votes minus sum of total negative votes) is visibly displayed next to all posting activity, which is similar to other feedback systems implemented at large eNoP within the software development industry. Second, TPC has a wide variety of spaces of interaction including programming question and answer forums in a variety of different programming languages, IT industry related discussion forums, industry and practice-related blogs, and off-topic discussion forums (see Table 1). This diversity of types of interaction forums is similar to other large eNoP within the software development industry and in other industries as well. Third, many eNoP particularly in the software development industry are ideology, paradigm, and/or platform specific such as Microsoft’s Channel 9 or the OTN Java Forums. TPC, on the other hand, is not specific to any single ideology or platform thereby offering a research setting that includes interactions involving a broad spectrum of different types of developers. Yet, TPC is also similar to other large, non-ideology, non-paradigm, and non-platform specific eNoP in the software development industry so as to not limit the generalizability of my results.

**Study 1 Overview**

In the first study investigating the first research question, I argue that off-topic forums have the potential to be virtual third places and participation within those virtual third places may positively impact practice-related contributions. A third place is an informal place outside of the home (first place) and work (second place) environments where individuals congregate for
informal sociability and interpersonal interactions (Oldenburg, 1989; Simmel, 1908/1971). I argue that participation within the third place portions of an eNoP may create a symbolically constructed place of emotional and psychological significance instead of ‘just another’ knowledge-sharing eNoP. Furthermore, when individuals associate a place as a significant place in their lives, they tend to form an intense loyalty to that place (Belk, 1992; Rosenbaum, 2006; Sherry, 1998). I additionally argue that individuals may form an emotional attachment (affective place attachment) to that place and, possibly, define a portion of himself or herself in relation to that place.

It is my conjecture that it is relatively easy for individuals to find alternative knowledge-sharing places among the many seemingly undifferentiated knowledge-sharing eNoP in cyberspace, but it is more difficult to find alternative places of emotional and psychological significance in the virtual world. As such, I argue that members who make identity claims with the eNoP through their third place participation and members who have greater affective place attachment (emotional attachment to a particular place) to the third place portions of the eNoP may have greater membership longevity and provide more positively rated contributions on the practice-side of the eNoP. I argue that this is the case because the third place provides individuals with a sense of wholeness and distinctiveness in addition to a sense of emotional expressiveness that cannot be easily replaced (Oldenburg & Brissett, 1982). Consequently, third place participants may have an increased propensity to be civically engaged in the wider social structure in order to ensure that the environment which contains the third place does not dissolve, which would inevitably lead to the dissolution of the third place as well (Oldenburg, 1989; Tolbert, Irwin, Lyson, & Nucci, 2002). Civic engagement in the case of an eNoP involves contributing practice-related content.
Lampel and Bhalla (2007) and Lerner and Tirole (2002) argue that status and reputation seeking are important extrinsic motivators for individuals to contribute to the public good. Insofar as a member’s score (sum of positive votes minus sum of negative votes) in the peer-to-peer feedback system is a measure of status or reputation; this suggests that individuals are motivated to achieve as high a score as possible. Furthermore, the switching cost associated with abandoning a site where a member has invested a lot of time and energy to ‘earn’ a high score is extremely high, because that member would have to start over at another eNoP. Therefore, those members with high scores in these systems will have a greater likelihood of continuing to participate (Lerner & Tirole, 2002). This idea is one of the basics tenets behind the implementation of peer-to-peer feedback systems within eNoP and other electronic social structures (Crowston, et al., 2012; Preece & Schneiderman, 2009). I further this argument by hypothesizing that the impact that a member’s score in the peer-to-peer feedback system will have on promoting future practice-related contributions will be qualified by site level identity claims resulting from third place participation and affective attachment to the third place portions of the eNoP. I argue that this is the case, because status attainment and maintenance in a place of emotional and psychological significance will be more important than status attainment and maintenance in ‘just another’ knowledge sharing eNoP.

This study involved two empirical sections. I first qualitatively demonstrate the applicability of the third place theoretical lens within the TPC café. Consistent with Oldenburg’s dimensions of third places, my analysis of the TPC café reveals that there are regular participants, a unique and entertaining atmosphere, a low profile, relative open access to all members of the eNoP, and a comfortable atmosphere promoting feelings of being at ease in conversations within the TPC café. My analysis also shows that the TPC café provides an escape from member’s daily
routines (both at home and at work), which Oldenburg (1989) theorizes is an important element of third places. The qualitative case also demonstrates that at least certain members identify strongly with the TPC café (and broader TPC eNoP) and have a strong emotional attachment to the TPC café.

Demonstrating that off-topic forums may have some of the characteristics of third places is interesting but does not refute the claim that off-topic interactions are noise or distractions from the practice-side of the eNoP (Phang, Kankanhalli, & Sabherwal, 2009; Preece & Schneiderman, 2009). As such, the second part of this study involved quantitatively testing the importance of third place participation on practice-related contributions using a robust sample of 3,401 TPC members. Using a series of time-to-event regression models, I demonstrate empirically that site level identity claims made by third place participants and greater affective third place attachment decrease the likelihood of membership inactivity within the practice-related forums and increase the likelihood of contributing a positively rated practice-related contribution. Results also show that the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related contributions is positively moderated by third place participation, primarily site level identity claims made by third place participants.

In this study, the impact that affective third place attachment and third place identity claims has on the likelihood of maintaining active membership on the practice-side is stronger than on the likelihood of contributing a positively rated practice-related contribution. This may be the case, because members voting content positively may not be an entirely objective measure of contribution quality. Previous literature has demonstrated that feedback systems may be used as platforms for status contests (Roberts, Hann, & Slaughter, 2006; D. Stewart, 2005) and ideological competitions (Barnett, Goodman, & Stewart, 2010), suggesting that positive and
negative voting practices may be dependent on socialization within the eNoP and may be independent of contribution quality (Resnick, Kuwabara, Zeckhauser, & Friedman, 2000). As such, the second study investigates voting practices in more detail.

**Study 2 Overview**

In the second study, I theoretically develop a model of voting practices (propensity to give and to receive positive or negative votes) using a cultural sociology perspective primarily leveraging Bourdieu’s integrated social theory (fields, forms of capital and habitus) and Eliasoph and Lichterman’s (2003) conceptualization of group style and culture in interaction. A cultural sociology perspective defines culture as processes of meaning-making rather than differences in values across groups (Griswold, 2008; Lamont, 2000; Spillman, 2002). Bourdieu specifically defines culture in terms of durable practices constituting a way of life defined and interpreted through the interaction of forms of capital, fields, and habitus (Bourdieu, 1993a). Eliasoph and Lichterman also define culture in terms of practices as Bourdieu does, but further propose that processes of meaning-making may differ depending on the specific style of the group and micro-level interaction patterns (Eliasoph & Lichterman, 2003).

The theory of capital postulates that individuals possess varying amounts of capital in many different forms (economic, social, symbolic and cultural) and may exchange one form of capital for another (Bourdieu, 1986). However, different forms of capital do not exist and do not have value except when viewed in relation to a specific field (Bourdieu & Wacquant, 1992), because certain fields may value one form of capital more than another (Bourdieu, 1986). A field is a macro-level social space consisting of “a set of objective, historical relations between positions anchored in certain forms of power (or capital)” (Bourdieu & Wacquant, 1992, p. 16). The link between individual action and fields is more than just different forms of capital, because social
reality exists both outside and inside of individuals (Bourdieu, 1990b). To account for this duality, Bourdieu conceptualizes habitus as a highly durable, generative structure that habitually conditions practice, consisting of a “set of historical relations ‘deposited’ within individual bodies in the form of mental and corporeal schemata of perception, appreciation and action” (Bourdieu & Wacquant, 1992, p. 16). Habitus, fields and forms of capital are three concepts that are interrelated and investigating one concept without also investigating the others is problematic as the definitions of each concept are defined in relation to the other two (Bourdieu & Wacquant, 1992; DiMaggio, 1979; DiMaggio & Powell, 1991; Emirbayer & Johnson, 2008).

Bourdieu’s integrated social theory, however, takes a holistic approach to understanding behavioral tendencies particularly those behaviors attributable to class distinctions, but this focus often does not adequately address emic differences in interaction patterns within specific contexts (Hall, 1992). To account for these emic differences, I utilize Eliasoph and Lichterman’s (2003) conceptualization of group style and culture in interaction. Eliasoph and Lichterman (2003, p. 737) define group style as “recurrent patterns of interaction that arise from a group’s shared assumptions about what constitutes good or adequate participation in the group setting.” They argue that group style serves as a filtering mechanism for collective representations and habitus resulting in culture in interaction.

Within this theoretical framework, I hypothesize that the propensity to receive a positive or a negative vote may, in part, be dependent on the social class of the receiver of feedback within the field, which is defined as the entire TPC site. I argue that those members of higher social classes determined by their scores in the peer-to-peer feedback system will have a higher propensity to receive positive votes and a lower propensity to receive negative votes on their contributions. In this manner, the peer-to-peer feedback system fosters a form of Matthew effect or cumulative
advantage (Merton, 1968) where ‘the rich get richer and the poor get poorer.’ Cumulative advantage is a mechanism for inequality across any temporal process where a favorable relative position becomes a resource that produces future relative gains (DiPrete & Eirich, 2006).

I further hypothesize that the greater the professional habitus differences between the giver and the receiver, the more likely that a post will be negatively voted (as opposed to positively voted). I argue that this is the case, because positively voting an individual with a competing habitus increases the social standing of, not only the individual being positively voted, but also of the group or class to which his/her habitus belongs (Barnett, et al., 2010). I also posit that posts that violate the group style will have a higher propensity of being negatively voted, because previous empirical research in offline social groups has demonstrated that members who violate the group style are met with awkward silence or rejection from the other group members (Eliasoph & Lichterman, 2003). I further hypothesize that the effect of small habitus differences will be amplified in the presence of a violation to the group style, because it is my conjecture that group style violations will intensify the effect of small practice-oriented differences between dyadic pairs of members which may otherwise be unnoticeable. Finally, the act of giving a negative vote is rare within these types of eNoP and may represent a distinct site level habitus distinguished by the social class of the voter. I propose that low class members (determined by the member’s score in the peer-to-peer feedback system) will have a higher propensity to give out negative votes, because they lack the cultural capital and associated site level habitus in order to act in an appropriate (cultured) manner.

Using a sample of 1,306 votes from 688 posts within the TPC Cubicle, a series of hierarchical linear regression models (HLM) support the claim that voting practices are indicative of the social class of the giver and the receiver of feedback, habitus differences
between the giver and the receiver of feedback, and the content and style of the post in relation to the group style. These factors remain significantly related to voting practices even after controlling for the quality of the post and previous voting interactions between the giver and the receiver of feedback. As such, the data analyses demonstrate empirically that understanding the occupational culture, the social class of the giver and the receiver of feedback, and the group style are important factors in determining how and why a post gets positively or negatively voted within these peer-to-peer feedback systems. In this manner, a vote is a complex social and cultural phenomenon that is dependent upon much more than just the quality of the post.

**Dissertation Theoretical and Practical Contributions**

Figure 1 outlines the contributions of each study independently and the contribution of the combined set of studies. Each study in this dissertation is expected to make a unique contribution to the literature independently. The first study augments existing research explaining the flow of knowledge using traditional networking variables derived from market ties (c.f. McLure Wasko & Faraj, 2005) and higher level community level motivators such as attachment and social bonding (c.f. Bateman, et al., 2006; Blanchard & Markus, 2004; Cummings, et al., 2002; Phang, et al., 2009; Ren, et al., 2012; Ren, et al., 2007; Ren, et al., 2012) by theorizing and demonstrating that affective place attachment to the third place portions of the eNoP and site level place identity claims by third place participants are important factors to consider when investigating the flow of knowledge, information and advice. Roberts et al. (2006) argue that motivators to contribute content interact in complex ways. The first study in this dissertation provides additional evidence that the impact of extrinsic motivators such as status and reputation as determined by a member’s score (sum of total positive votes minus sum of total negative votes) in the peer-to-peer feedback system are partly dependent on site level
identity claims by third place participants and affective attachment to the third place portions of the eNoP.

Figure 1. Research Contribution of Studies Individually and Combined

The second study contributes to the broad stream of literature on social stratification within electronic social structures and also contributes to previous literature on the use of peer-to-peer feedback systems as platforms for status contests and ideological competitions (c.f. Barnett, et al., 2010; Crowston & Kammerer, 1998; Roberts, et al., 2006; D. Stewart, 2005). Additionally, the second study provides further evidence for the claim that peer-to-peer feedback systems may be more effective in fostering long-term community growth if they incorporate contextual factors such as the style of the group, professional habitus differences and structural positioning of the giver and the receiver of feedback into their design (Wang & Chiang, 2009). Finally, the second study contributes broadly to the IT and culture literature by offering a different perspective on culture. A cultural sociology perspective defines culture in terms of processes of meaning-
making (Griswold, 2008; Lamont, 2000; Spillman, 2002) instead of the traditional culture as values definition used in much of the information systems literature (Leidner & Kayworth, 2006).

Although each study makes a separate contribution to the literature, the studies together make several contributions. First, cultural sociology perspectives and theories of place both complement existing eNoP literature as well as shift the focus of the eNoP literature away from a resource exchange perspective to more of a social (or a cultural) systems perspective (Kraut, Wang, Butler, Joyce, & Burke, 2010). eNoP may be designed to share domain-specific knowledge, information, and advice, but these sites also offer rich opportunities for sociability and third place style interactions. A resource exchange perspective often views off-topic social interactions as noise distracting members from the practical purpose of the site (Phang, et al., 2009; Preece, 2000; Preece & Schneiderman, 2009), but a social (or a cultural) systems perspective views these off-topic social interactions as possible third place style mechanisms with distinctive cultures and group styles (Oldenburg, 1989), which may strengthen the overall eNoP and strengthen the quality of the resources being exchanged on the practice-side of the eNoP. Issues of social stratification and culture in interaction further support the idea that eNoP might be better understood through a social (or a cultural) systems perspective as social and cultural systems are places with social hierarchies, class distinctions, and group styles, which impact social interactions and the exchange of resources.

Second, the NoP and eNoP literature broadened the concept of communities of practice (CoP) to focus on the structure of the network (i.e. various measures of network centrality and network density) that form around a specific practice in the absence of core CoP concepts such as trust, reciprocity, and mutual engagement (Brown & Duguid, 2000; McLure Wasko & Faraj,
2005; Whelan, 2007). My research suggests that researchers may consider broadening the concepts of NoP and eNoP to focus on the structure of the field as opposed to (or in addition to) the structure of the network. One of the core characteristics of the eNoP literature is the idea that eNoP are emergent (McLure Wasko & Faraj, 2005), but many eNoP such as www.dreamincode.net, www.stackoverflow.com and www.codeproject.com have been in existence for over a decade with relatively stabilized social structures. Therefore, it may be time to move beyond studying the emergent properties of these networks using weak domain-specific ties to studying a diversity of ties (i.e. weak, strong and place-related) and how these social structures are reproducing themselves. A field of practice may have multiple spaces of interaction including off-topic forums, which may influence the social dynamics in other areas of the field (Levina & Vaast, 2008). Fligstein and McAdam (2011, pp. 21-22) state that “if a field is really an arena where individuals, groups, or organizations face off to capture some gain as our view suggests, then the underlying logic of fields is not a network of ties, but power and culture.” Focusing on the field enables these electronic social structures to be conceptualized as places of both competition and cooperation, facilitated by score keeping mechanisms such as peer-to-peer feedback systems.

Third, Wang and Chiang (2009) argue that institutional mechanisms such as peer-to-peer feedback systems might be more effective in fostering community growth if these systems incorporate contextual factors into their design. My research focuses on member-place identity and affective place attachment to the third place portions of the network along with issues related to structural positioning and dispositional differences between members as the primary contextual factors related to social dynamics. From a practical perspective, systems designers may want to account for these social and cultural factors when designing peer-to-peer feedback
systems in order to maximize their stated design goals of promoting future (high-quality) practice-related contributions and to minimize their use in terms of promoting the Matthew effect and reproducing the social order, especially when the social order is not determined based on dimensions of quality.

The remainder of this dissertation is organized into three sections. The first two sections contain the two independent empirical studies. Each one of these sections has a separate literature review, research design and methods, data analysis, and discussion sections. The third and final section of the dissertation discusses the theoretical and practical ramifications of the combined research project along with areas of future research.
CHAPTER 2. Third Places within Electronic Networks of Practice: Place Identity, Affective Place Attachment, Membership Longevity and Contribution Quality

Abstract

In a two part study, I first qualitatively demonstrate that off-topic forums within eNoP have the potential to be virtual third places, special types of informal gathering places. I then quantitatively demonstrate that members who have greater affective place attachment to the third place portions of the network and members who make identity claims with the eNoP through their third place participation have an increased likelihood of contributing a positively rated practice-related contribution and a decreased likelihood of becoming inactive on the practice side of the eNoP. I further demonstrate empirically that the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related contributions is qualified by third place participation, most notably site level identity claims made by third place participants.
Introduction

Understanding why members contribute and remain active in all types of virtual environments are important issues facing site owners and administrators, because many of these electronic social structures fail to gain a critical mass of participants and subsequently fail (Butler, 2001; Ma & Agarwal, 2007; Markus, 1987; Ransbotham & Kane, 2011). Previous research has investigated individual intrinsic motivators such as altruism and general enjoyment (Constant, et al., 1996; Sproull, et al., 2005), individual extrinsic motivators such as status and reputation (Lampel & Bhalla, 2007; Lerner & Tirole, 2002), community level motivators such as commitment, social bonding and generalized reciprocity (Bateman, et al., 2006; Blanchard & Markus, 2004; Cummings, et al., 2002; Ren, et al., 2007; Ren, et al., 2012), and structural factors such as network centrality and social capital (Chiu, Hsu, & Wang, 2006; McLure Wasko & Faraj, 2005) in order to explain and predict the flow and quality of member contributions. Noticeably absent from this list of motivators, however, is the attachment that members may form to the electronic social structure as a place. Place is potentially an important motivator because human behavior may be explained by the setting (place) in which it occurs (Bitner, 1992) and attachment to places provides individuals with a sense of stability and continuity (Fried, 2000; Giuliani, 2003; Gustafson, 2001; Wynveen, Kyle, & Sutton, 2012).

In the case of electronic social structures, place may refer to any space where norms, routines, and other practices are constructed through continuous, repeated interactions (Sarker & Sahay, 2004). In this sense, places do not have to constitute geographic locations, but, instead, constitute mental representations derived from social interactions within a situated geography (Meyrowitz, 1985; Saunders, Rutkowski, van Genuchten, Vogel, & Orrego, 2011) and the psychological processes associated with “experience and meaning that helps to provide human
beings with the sense of attachment, stability, and security” (Sarker & Sahay, 2004, p. 4). In this study, place refers to psychological states and perceptions of meaning rather than physical locations (Sarker & Sahay, 2004; Saunders, et al., 2011).

Electronic networks of practice (eNoP) are special types of knowledge-sharing electronic social structures, which are focused on solving domain-specific problems concerning a skill-based craft or profession usually organized in question and answer style forums; eNoP typically contain members who are only loosely connected with each other (Brown & Duguid, 2000; McLure Wasko & Faraj, 2005; Vaast & Walsham, 2009). The eNoP literature has dedicated a significant amount of attention to the utilitarian aspects of these sites by focusing on learning and the spread of domain-specific knowledge, information and advice using resource exchange perspectives based on weak, practice-related ties (Anand, Gardner, & Morris, 2007; Duguid, 2005; Faraj & Xiao, 2006; Vaast & Walsham, 2009; Whelan, 2007). However, many eNoP such as www.valueforum.com in the field of investment management, www.codeproject.com in the field of software development, and www.doctorslounge.com in the field of medicine include multiple spaces of interaction beyond just the practice-related forums whereby the spread of knowledge, information and advice is coupled with general sociability (i.e. off-topic forums discussing politics or sports) (Ren, et al., 2012; Ridings & Gefen, 2004). Previous literature on professional knowledge networks and eNoP view off-topic discussion forums as noise distracting members from the exchange of resources and a means to possibly drive members away from the site (Phang, et al., 2009; Preece, 2000; Preece & Schneiderman, 2009).

I argue that off-topic forums have the potential to be virtual third places and participation within these virtual third places has the potential to increase (not decrease) participation on the practice side of the eNoP. A third place is an informal place outside of the home (first place) and
work (second place) environments where individuals congregate for informal sociability and interpersonal interactions (Oldenburg, 1989; Simmel, 1908/1971). I argue that participation within the third place portions of an eNoP may create a symbolically constructed place of significance instead of ‘just another’ knowledge-sharing eNoP. Furthermore, when individuals associate a place as a significant place in their lives, they tend to form an intense loyalty to that place (Belk, 1992; Rosenbaum, 2006; Sherry, 1998). In addition to forming an intense loyalty to that place, I further argue that individuals may form an emotional attachment (affective place attachment) to that place and, possibly, define a portion of himself or herself in relation to that place.

It is my conjecture that it is relatively easy for individuals to find alternative knowledge-sharing places among the many seemingly undifferentiated knowledge-sharing eNoP in cyberspace, but it is more difficult to find alternative places of emotional and psychological significance in the virtual world. As such, I argue that members who make identity claims with the eNoP through their third place participation and members who have greater affective place attachment (emotional attachment to a particular place) to the third place portions of the eNoP may have greater membership longevity and provide more positively rated contributions on the practice-side of the eNoP. I argue that this is the case, because the third place provides individuals with a sense of wholeness and distinctiveness in addition to a sense of emotional expressiveness that cannot be easily replaced (Oldenburg & Brissett, 1982). Consequently, third place participants may have an increased propensity to be civically engaged in the wider social structure in order to ensure that the environment which contains the third place does not dissolve, which would inevitably lead to the dissolution of the third place as well (Oldenburg, 1989;
Tolbert, et al., 2002). Civic engagement in the case of an eNoP involves contributing practice-related content.

Lampel and Bhalla (2007) and Lerner and Tirole (2002) argue that status and reputation seeking are important extrinsic motivators for individuals to contribute to the public good. Insofar as a member’s score (sum of positive votes minus sum of negative votes) in the peer-to-peer feedback system is a measure of status or reputation; this suggests that individuals are motivated to achieve as high a score as possible. Furthermore, the switching cost associated with abandoning a site where a member has invested a lot of time and energy to ‘earn’ a high score is extremely high, because that member would have to start over at another eNoP. Therefore, those members with high scores in these systems will have a greater likelihood of continuing to participate (Lerner & Tirole, 2002). This idea is one of the basics tenets behind the implementation of peer-to-peer feedback systems within eNoP and other electronic social structures (Crowston, et al., 2012; Preece & Schneiderman, 2009). I further this argument by hypothesizing that the impact that a member’s score in the peer-to-peer feedback system will have on promoting future practice-related contributions will be qualified by site level identity claims resulting from third place participation and affective attachment to the third place portions of the eNoP. I argue that this is the case, because status attainment and maintenance in a place of emotional and psychological significance will be more important than status attainment and maintenance in ‘just another’ knowledge sharing eNoP.

The purpose of this study is threefold. First, I investigate whether off-topic forums have the potential to be virtual third places. Second, I address whether third place participation impacts practice-related contributions. Finally, I examine whether third place participation impacts the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related
contributions. I do this by performing an in-depth study of TPC, a large eNoP of software developers. I first qualitatively analyze the off-topic forum within TPC (referred to as the TPC café) in relation to the core dimensions of third places defined by Oldenburg (1989). I then quantitatively test whether third place participation impacts practice-related contributions using a series of time-to-event regression models.

My study makes several theoretical contributions. First, previous literature has demonstrated that community attachment, commitment to the community, social bonding, generalized reciprocity, and a general sense of community are important factors motivating member contributions and membership longevity (Phang, et al., 2009; Ren, et al., 2012; Ren, et al., 2007; Ren, et al., 2012). My study complements this research by demonstrating the importance of place attachment formed via third place participation in explaining member contributions and general membership activity. Second, issues of identity and identity claims in relation to the community or to the practice have been found to be important factors governing the social dynamics within eNoP and related communities of practice (CoP) (Ma & Agarwal, 2007; Wenger, 1998), but issues related to place identity have not received much attention in this line of research. Third, Roberts et al. (2006) argue that motivators to contribute content interact in complex ways. I contribute additional evidence for this idea by empirically demonstrating that the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related contributions is qualified by third place participation.

The remainder of this study is organized as follows. First, I review relevant and selected literature on electronic networks of practice, motivations for contributing to various electronic social structures, third places, place attachment and place identity. Second, I develop five research hypotheses based primarily on the place and third place literature. Third, I discuss the
research design and methods used in this study. Fourth, I present and discuss the qualitative and quantitative results. Fifth, I conclude with a discussion of the implications of my research along with potential areas for future study.

**Literature Review**

The network of practice literature (NoP) is an extension of the community of practice (CoP) literature (see Table 2 at the end of this section). The CoP literature as used by information systems scholars was theoretically derived from literature on cognitive apprenticeship, situated learning, and interpretive systems (Brown, Collins, & Duguid, 1989; Daft & Weick, 1984; Lave, 1988; Lave & Wenger, 1991). A CoP refers to a group of people engaged in learning (as a collective, social process) a skill-based craft whereby knowledge is situated within a community (Brown & Duguid, 1991; Lave & Wenger, 1991). The CoP literature includes core learning concepts such as legitimate peripheral participation (peripheral members learn from masters), mutual engagement (group norms and collaborative relationships), joint enterprise (shared understanding of the practice), shared repertoire (shared set of community resources), narration (war stories from the field), identification (identity claims related to the craft, profession or community), and collaboration (culture of sharing) (Brown & Duguid, 1991; Lave & Wenger, 1991; Orr, 1996; Wenger, 1998).

In general, the CoP literature is split into two main streams of research with different assumptions and implications (Murillo, 2011). First, there is the idea that CoP are informal, emergent structures that operate outside of the control of management designed to solve routine problems of practice (Brown & Duguid, 1991; Orr, 1996; Wenger, 1998). In this context, the core competencies of an organization reside within the CoP (Brown & Duguid, 1991; Tsoukas & Vladimirou, 2007; Wenger, 1998), and the knowledge held within a CoP cannot easily be
extracted and used by non-members (Cox, 2007; Duguid, 2006; Orr, 1996). Second, there is the idea that CoP are strategic, knowledge resources for an organization’s management to leverage in order to accomplish strategic organizational objectives (Anand, et al., 2007; Kimble & Bourbon, 2008; Lesser & Storck, 2001; Thompson, 2005; Wenger, McDermott, & Snyder, 2002; Wenger & Snyder, 2000). These researchers argue that CoP may be actively managed (Anand, et al., 2007; Thompson, 2005; Wenger, et al., 2002), and, consequently, CoP may be used for strategically important tasks and not just routine tasks (Anand, et al., 2007).

A CoP is conceptually similar to many other concepts in the literature. For example, the following concepts all have slightly different dimensions and nuances, but the core elements of CoP are generally included: communities of knowing (Boland Jr. & Tenkasi, 1995), knowledge communities (Earl, 2001), knowledge networks of various varieties (Buchel & Raub, 2002), strategic communities (Storck & Hill, 2000), communities of coping (Korczynski, 2003), context in learning (Barnes, 1983), knowing in action (Amin & Roberts, 2008), and interpretive communities (Fish, 1980). The main differences between these concepts concern the primary purpose of the community, whether knowledge is situated and may be extracted from the community, and management’s ability to control these social structures. Other concepts such as epistemic cultures (Knorr-Cetina, 1999, p. 8), occupational communities (Bechky, 2003; Van Maanen & Barley, 1984), occupational cultures (Trice, 1993), and communities of technological practitioners (Constant II, 1980) focus on the culture of a craft or profession and how cultural differences pertaining to the occupation impact social interactions and the exchange of knowledge whereas the CoP literature focuses more on the information being shared (Wenger, 1998).
The CoP literature is primarily focused on spreading knowledge within an organization and not necessarily spreading knowledge to/from colleagues residing outside of organizational boundaries (Whelan, 2007). Wenger (1998) argues that CoP are not the same as interpersonal networks or the structure of a member’s network, because the emphasis of the CoP literature is on what information is shared and notions of community rather than on the structure of the relationships. Yet, social networking theorists argue that it is not possible to separate the knowledge generated from the underlying structure of the network (Hansen, 1999). As such, Brown and Duguid (2000) extend the CoP concept to include the emergent, informal networks that facilitate the exchange of practice related information and advice. They call these emergent structures networks of practice (NoP), and formally define them as “networks that link people to others whom they may never get to know but who work on similar practices” (Brown & Duguid, 2000, p. 141).

Members of NoP share a common set of practices and base set of domain-specific knowledge similar to CoP, but differ conceptually from CoP in the sense that most members of a NoP are only loosely connected to each other (Brown & Duguid, 2000). The connections between members are indirect, typically in large, geographically dispersed networks (Brown & Duguid, 2000; Whelan, 2007). The power of a NoP comes from the weak ties that connect members with each other, and it is those weak ties that facilitate knowledge sharing to and through nodes in a network (Granovetter, 1973). The NoP literature switches the focus of the CoP literature away from communities to networks (Murillo, 2011; Wenger, 1998).

McLure-Wasko and Faraj (2005) extend the concept of a NoP to a virtual environment by coining the term electronic network of practice (eNoP). They define an eNoP as “a special case of the broader concept of networks of practice where the sharing of practice-related knowledge
occurs primarily through computer based communication technologies” (McLure Wasko & Faraj, 2005, p. 37). They argue that the computer-mediated communication aspect (i.e. blogs, message boards, bulletin board systems, listservs and so on) alters the social dynamics of eNoP relative to the non-electronic networks of practice defined and studied by Brown and Duguid (2000). McLure-Wasko and Faraj’s (2005) definition assumes that eNoP have three core properties: (1) open, (2) self-organizing and (3) emergent. Open refers to the idea that participation is generally open to any individual interested in the shared practice and willing to engage other members in order to solve practice related problems. Self-organizing refers to the voluntary nature of eNoP and the idea that these structures are organized around the practices of its members (McLure Wasko & Faraj, 2005). They are also emergent meaning the social order that gets formed is not typically based on formal rules (McLure Wasko, Teigland, & Faraj, 2009).

Examples of eNoP are sites such as www.codeproject.com, www.stackoverflow.com and www.dreamincode.net where hundreds of thousands of members (virtually) gather to share, discuss and debug snippets of code. eNoP researchers argue that the ties between members are generally weak, because the sole means of communication is electronic (McLure Wasko & Faraj, 2005). The sharing of domain-specific knowledge through weak ties in an eNoP is in contrast to a portion of the traditional knowledge management literature, which argues that knowledge sharing requires a strong tie between individuals (Krackhardt, 1992) or requires status similarities between individuals (B. P. Cohen & Zhou, 1991). Hansen (1999) further proposes that tacit knowledge generally requires a strong tie to exchange such knowledge, but the eNoP literature is rooted on the strength of weak ties and the ability to share complex knowledge throughout network regardless of tie strength (Gittelman & Kogut, 2003; Whelan, 2007).
The challenge to applying CoP and NoP concepts in the virtual world is to distinguish between virtual environments with a narrow set of domain-specific practices and those with a constellation of practices (Wenger, 1998). Many virtual environments are large, complex social structures with hundreds of thousands of members, suggesting that there may not be a single unifying set of practices within the social structure (Wenger, 1998, p. 124). Many studies are also stretching the definition of a skill-based craft and the core components of CoP when applying these concepts to virtual environments. For example, Silva et al. (2009) make the case that a community of bloggers (MetaFilter) who write about anything from politics to history to current events is a virtual CoP. They argue that participation in the blogosphere follows a path of legitimate peripheral participation, but this may be questionable as there may not be a core set of practices used to define a MetaFilter blogger or a quality blog post, and the idea of joint enterprise may not be applicable as bloggers at MetaFilter typically discuss a plethora of topics. Studies of Wikipedia have also applied the CoP literature (Bryant, Forte, & Bruckman, 2005) in order to explain social interactions in Wikis, but whether there is a core set of practices in determining what constitutes a ‘Wikipedian’ may also be questioned.

eNoP have been studied in a variety of contexts. For example, Roberts et al. (2006) and Shah (2006) studied eNoP in open source software development, McLure-Wasko and Faraj (2005) studied the legal industry, Vaast (2004) and Vaast and Walsham (2009) studied the field of public health, and Teigland and Wasko (2004) studied technology consulting. In addition to having been studied in a variety of contexts, eNoP have also been studied through a variety of conceptual frameworks including (trans-) situated learning theory (Vaast & Walsham, 2009), social capital theory (Huysman & Wulf, 2006; McLure Wasko & Faraj, 2005), a combination of social cognitive and social capital theories (Chiu, et al., 2006), identity theory (Ma & Agarwal,
a combination of social networking and knowledge-based theories of the firm (Whelan, 2007), actor-network theory (Takhteyev, 2009), and theories of collective action (McLure Wasko, et al., 2009). The primary focus of these studies is on the network, and explaining learning and the flow of knowledge, information and advice using networking constructs, albeit from different theoretical perspectives (Vaast & Walsham, 2009; Whelan, 2007). In general, the eNoP literature decenters the idea of community and strong ties, arguing that the size of the eNoP and the electronic medium of exchange render these concepts not applicable (McLure Wasko & Faraj, 2005; McLure Wasko, et al., 2009).
<table>
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<th><strong>Theoretical Origins</strong></th>
<th><strong>Communities of Practice (CoP)</strong></th>
<th><strong>Networks of Practice (NoP) and Electronic Networks of Practice (eNoP)</strong></th>
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<tr>
<td><strong>Key Attributes</strong></td>
<td>Informal, emergent structures that operate outside of the control of management designed to solve routine problems of practice (Brown &amp; Duguid, 1991; Orr, 1996; Wenger, 1998)</td>
<td>Strategic, knowledge resources for an organization’s management to leverage in order to accomplish organizational initiatives (Anand, et al., 2007; Kimble &amp; Bourbon, 2008; Lesser &amp; Storck, 2001; Thompson, 2005; Wenger, et al., 2002; Wenger &amp; Snyder, 2000)</td>
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<tr>
<td><strong>Related Concepts</strong></td>
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<td><strong>Examples</strong></td>
<td>Xerox technicians informally meeting to discuss war stories about how to fix faulty copiers or network administrators meeting for coffee once a week to share network administration tips and tricks</td>
<td>CoP at the World Bank cultivated by management in order to start new lines of business or to transfer tacit knowledge to other areas of the bank</td>
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Many eNoP, professional knowledge-sharing sites, and related user-generated content sites do not gain a critical mass of participants and subsequently fail (Ma & Agarwal, 2007; Markus, 1987). As such, understanding why users contribute to these sites is of paramount importance to researchers, owners, and administrators of these sites. Consequently, much of the research on eNoP has studied why participants contribute knowledge in these electronic exchanges (c.f. McLure Wasko & Faraj, 2005; Roberts, et al., 2006; Shah, 2006; Teigland & McClure Wasko, 2003; von Hippel & von Krogh, 2003). Motivators may loosely be divided into individual intrinsic motivators, individual extrinsic motivators, higher level community motivators and structural factors impacting user contributions. The next section of the study discusses each one of these factors. Table 3 displays a summary of the different motivators (displayed at the end of the next section).

**Motivators to Contribute Content**

At the individual intrinsic level, previous research demonstrates that individuals contribute to the public good for altruistic reasons, for fun or general enjoyment, for learning opportunities, and for general individual needs (Constant, et al., 1996; Kankanhalli, Tan, & Wei, 2005; Lakhani & Von Hippel, 2003; Shah, 2006; Sproull, et al., 2005). Shirky (2010) further argues that two primary intrinsic motivators to contribute to the public good in the digital era are the desire to be autonomous (determine what to do and when to do it) and the desire to be competent (to be good at a specific task). Shah (2006) demonstrates that feeling needed is one of the primary intrinsic reasons why an individual participates in open source development projects, and developers subsequently leave open source projects when they no longer feel needed. All of these intrinsic factors may lead to a higher self-esteem or a higher feeling of self-worth, regardless of whether
those feelings are externally visible to others (Constant, et al., 1996; McLure Wasko & Faraj, 2005).

Economics literature suggests that people contribute to the public good when the benefits outweigh the costs (Lerner & Tirole, 2002). Particularly in large networks, however, there is an economic incentive to free-ride (i.e. consume knowledge without contributing any), because contributing to the public good takes a significant amount of time and energy (costs), but the information (benefits) is available to all members regardless of participation rate (Bock, Zmud, Kim, & Lee, 2005; Ma & Agarwal, 2007). In this sense, individuals contribute to the public good to maximize their own personal welfare and to satisfy their own external self-interest (Lampel & Bhalla, 2007). Extrinsic motivators (performing an activity to attain an outcome) include external recognition, status, and reputation (Lakhani & Von Hippel, 2003; Lampel & Bhalla, 2007; Lerner & Tirole, 2002). The economic rewards attributable to extrinsic factors such as reputation or status resulting from contributing to the public good may not be immediate, but there may be greater long-term career opportunities or a greater salary for contributing to a knowledge network (Lerner & Tirole, 2002; von Hippel & von Krogh, 2003). Many members contribute to knowledge networks online for general sociability purposes (Gu, Konana, Rajagopalan, & Chen, 2007; Phang, et al., 2009). This general social affiliation may be considered an intrinsic motivator when it is not visible to others and not accumulated for any profit maximization purposes (Bock, et al., 2005), but the accumulation of social capital may be an extrinsic motivator when it is visible to others and when it may be used in an opportunistic, self-interested manner (Chiu, et al., 2006; McLure Wasko & Faraj, 2005).

Other literature focuses on higher level group or community level factors motivating members to contribute. Community motivators such as the norm of reciprocity, commitment,
attachment, and the sense of community have been found to increase member contributions in a
variety of virtual contexts (Bateman, et al., 2006; Blanchard & Markus, 2004; Cummings, et al.,
2002; Ren, et al., 2012; Ren, et al., 2007; Ren, et al., 2012). The norm of reciprocity has been
found to be positively correlated with usage of knowledge-sharing electronic repositories and
positively related to attitudes toward knowledge-sharing and sharing intentions (Bock, et al.,
2005; Kankanhalli, et al., 2005). Previous literature indicates that those members with an
increased commitment to the network, the community or the profession have an increased
likelihood of contributing knowledge (Bateman, et al., 2006; McLure Wasko & Faraj, 2005;
Wasko & Faraj, 2000). Attachment and identification with a group or a community have also
been found to be important motivators for future knowledge contributions whereby a cognitive
and emotional attachment to the collective promotes ongoing commitment and future
contributions (Ashforth, 2001; Fang & Neufeld, 2009; Ren, et al., 2012).

There has also been a fair amount of research on structural factors such as critical mass of
participants (Markus, 1987), community size (Butler, 2001; Ransbotham & Kane, 2011) and
external firm/community recognition (Jeppesen & Frederiksen, 2006), which either enable or
constrain the flow of knowledge throughout these electronic social structures. For example,
previous research using network analyses with ties generated on the practice-side of the eNoP,
network exchange theory, and social capital creating a collectivist culture of sharing have been
found to impact member contributions or intentions to contribute (Chiu, et al., 2006; Faraj &
Johnson, 2011; McLure Wasko & Faraj, 2005; Nambisan & Baron, 2010). Online and offline
institutional structures have also been theorized to be important factors governing social
behaviors in virtual environments (DiMaggio, Hargittai, Neuman, & Robinson, 2001; Hercheui,
2011). Stewart and Gosain (2006), for example, theorize that culture and ideology may be
important factors facilitating trust and commitment, which may lead to increased group
effectiveness and a higher propensity to share knowledge (Bateman, et al., 2006). Faraj,
Jarvenpaa, and Majchrzak (2011) further theorize that knowledge collaboration takes place in
many virtual communities despite the lack of existing social relationships and without existing
organizational mechanisms such as ownership and hierarchy facilitating or mandating the
exchange of knowledge.

Crowston et al. (2012) point out that motivators may not be static and may change or evolve
over time. Faraj and colleagues (2011) further note that social dynamics within virtual
communities are fluid, meaning that a different set of motivators may be salient at different
periods of time in order to foster knowledge collaboration. Other literature suggests that certain
extrinsic motivators such as status-seeking and reputation-seeking may undermine intrinsic
motivators such as general enjoyment when a task or contribution is perceived as important for
the member’s ability to attain a high-status or reputation in the community (Roberts, et al.,
2006). Roberts et al. (2006) further demonstrate empirically in the context of open source
developers that developers' motivations to contribute to open source projects are not independent
of one another but rather are related in complex ways depending on the context.
Table 3. Motivators for User Contributions in Assorted Virtual Environments

<table>
<thead>
<tr>
<th>MOTIVATORS</th>
<th>THEORETICAL ORIGIN</th>
<th>FACTORS</th>
<th>SAMPLE REFERENCES*</th>
</tr>
</thead>
</table>
| Individual Intrinsic Motivators | 1. Theories of altruism and prosocial behavior in sociology and psychology  
2. Cognitive Surplus | 1. Altruism  
2. Fun or general enjoyment  
3. Learning opportunities  
4. Autonomy  
5. Competency  
6. Feeling needed (self-worth)  
7. Higher self esteem  
| Individual Extrinsic Motivators | 1. Economic theories of utility where people participate when the benefits are greater than the cost  
2. Economic signaling theory related to status and reputation | 1. Status  
2. Reputation  
3. Career Opportunities  
4. Greater payouts in terms of future earnings  
5. Social capital as an asset that may be exchanged to maximize a member’s self interest | Chiu, et al., 2006; Lakhani & Von Hippel, 2003; Lampel & Bhalla, 2007; Lerner & Tirole, 2002; McLure Wasko & Faraj, 2005; von Hippel & von Krogh, 2003 |
| Community Level Motivators | 1. Organizational commitment  
2. Identity theory  
3. Attachment theory  
4. Social bond theory  
5. Social psychology | 1. Generalized reciprocity or the norm of reciprocity  
2. Commitment to the group  
3. Commitment to the community  
4. Attachment  
5. Sense of community  
6. Collectivist norm  
7. Identity claims related to the group or community | Bateman, et al., 2006; Blanchard & Markus, 2004; Bock, et al., 2005; Cummings, et al., 2002; Kankanhalli, et al., 2005; Ren, et al., 2012; Ren, et al., 2007; Ren, et al., 2012 |
| Structural Motivators/Factors | 1. Network Exchange Theory  
2. Social Capital Theory  
2. Network Structure  
3. Position within the Network  

*Some literature may be in multiple rows because they theorized about several different motivators in their research
Table 3 summarizes the literature on motivations to contribute content in a variety of electronic social structures. What is noticeably absent from these motivators, however, are factors related to place and attachments that individuals form to specific places as an explanation as to why individuals contribute to and remain active in these electronic social structures. Despite the lack of physical geography associated with virtual environments, I argue that issues related to place may serve as important motivators for several reasons. First, Steele (1981) argues that a ‘sense of place’ and a ‘sense of belonging’ to a place may directly influence an individual’s actions, reactions and behaviors. A core assumption of the psychology of place literature is the idea that individuals strive for a sense of belonging to a place and will engage in behaviors to maintain and/or find that sense of belonging (Fullilove, 1996; Steele, 1981). Second, human behavior is influenced by the setting (place) in which it occurs (Bitner, 1992). Understanding the attachment that individuals have with places and the place itself are important factors governing human behaviors (Bitner, 1992; Gieryn, 2000). Third, attachment to places provides individuals with a sense of stability and continuity (Fried, 2000; Giuliani, 2003; Gustafson, 2001; Wynveen, et al., 2012). Giuliani (2003, p. 137) states the following concerning the impact that place and attachment to places have in terms of impacting human behaviors and actions:

Not only do we acknowledge the existence of an affective bond with places, but also the importance that this can have in qualifying our existence, whether positively or negatively. And not just our individual, private, existence, but also the existence of entire human groups. There is perhaps no feeling of mutual affinity, community, fraternity among persons, whether formal or informal, institutionalized or not – nor feeling of diversity, aversion, hostility – that is not in some way related to matters of place, territory and attachment to places. For better or worse, this has far-reaching implications.

If an eNoP closes, I argue there may be a feeling of loss. This loss is not necessarily to the people, the group, or the community as the former members may certainly congregate and continue their conversations elsewhere in cyberspace without too much difficulty, but to the
eNoP as a place. Previous literature, however, has demonstrated the importance of the former (attachment to the community) but not the latter (attachment to the place) (Phang, et al., 2009; Ren, et al., 2012; Ren, et al., 2007; Ren, et al., 2012). Place attachment parallels but is ultimately distinct from attachment to people (Fullilove, 1996). As such, taking a conversation from one eNoP to another eNoP, say from www.codeproject.com to www.stackoverflow.com, may change the nature of the conversation even if the eNoP are seemingly very similar in terms of design and structure. The old place, for example, may have a sense of nostalgia or is associated with a set of memories that may be difficult to duplicate in another environment. The next section of the study conceptualizes place and how place may be defined in virtual environments.

**Conceptualizing Place**

Place is a complex concept that has garnered significant attention across a variety of disciplines (Gieryn, 2000; Saunders, et al., 2011). In general, place is any space endowed with meaning and is a product of the societies in which people live (Low & Altman, 1992; Relph, 1976; Tuan, 1977). Places are in some way physically constructed and are also in some way interpreted, perceived, understood and imagined (Gieryn, 2000). The place literature involves the interpretation of human behavior in connection with the physical settings in which the action occurs (Agnew, 1987; Tuan, 1977). Both Canter (1977) and Relph (1976) conclude that places contain physical settings (attributes), activities (actions), and meanings (conceptions). Agnew (1987) similarly argues that conceptualizations of place include a locale (formal or informal settings constituting social relations), a location (geographic area defined by social and economic processes), and a sense of place (structure of feeling). Simply focusing on the physical setting without understanding the meaning that places have to groups or individuals is problematic,
because place involves “a deep and unreflective participation in the symbols of a place” (Relph, 1976, p. 142).

In the case of electronic social structures, place may refer to any space where norms, routines, and other practices are constructed through continuous, repeated interactions (Sarker & Sahay, 2004). In this sense, places do not have to constitute geographic locations, but, instead, constitute mental representations derived from social interactions within a situated geography (Meyrowitz, 1985; Saunders, et al., 2011) and the psychological processes associated with “experience and meaning that helps to provide human beings with the sense of attachment, stability, and security” (Sarker & Sahay, 2004, p. 4). In this study, I use the term place to refer to psychological states and perceptions of meaning rather than physical locations (Sarker & Sahay, 2004; Saunders, et al., 2011).

In the context of 3D virtual communities such as Second Life, Saunders et al. (2011, p. 1080) note that a “virtual place is defined as the perception of bounded space imbued with meaning.” They further theorize that a sense of place is formed through the interaction with virtual objects (Saunders, et al., 2011). However, a sense of place may also involve lived experiences associated with social relationships in some specific context (Gustafson, 2001). In virtual environments, a sense of place involves the actions people take, the identity claims they make through their virtual interactions, and the social interaction patterns that happen within conceptually bounded situational geography (Meyrowitz, 1985; Saunders, et al., 2011).

Third Places

Third places are special types of places that are often significant places to individuals and to the broader social structure (Oldenburg, 1989; Oldenburg & Brissett, 1982; Whyte, 1988). Third places are physical places outside of the home (first place) and work (second place)
environments where individuals congregate for informal sociability in order to satisfy individual’s need for interpersonal interaction and to strengthen the local community (Oldenburg, 1989; Simmel, 1908/1971). Examples of third places include neighborhood pubs, traditional cafés (not the modern Internet cafés), and country stores. These types of third places act as anchors of communities that facilitate broader, more creative interactions (Oldenburg, 1989). Oldenburg (1989) argues that there are eight defining characteristics of third places: (1) neutral ground (minimal social obligations), (2) leveler (status neutral environments), (3) conversation (verbal interactivity is the central activity), (4) accessibility and accommodation (easy to access), (5) regulars (frequent participants), (6) playful mood (laughter and wit), (7) low profile (homely without pretension), and (8) a home away from home (warm atmosphere fostering feelings of being at ease).

Third places offer the opportunity for pure sociability or the play-form of association (Simmel, 1908/1971). Simmel (1908/1971) argues that individuals have a fundamental need to converse with others and to associate with others, but this need is often not met in the outside world (Oldenburg & Brissett, 1982). Within the play-form of association, “the surrender of outward status is rewarded by unqualified acceptance into human fellowship” (Oldenburg & Brissett, 1982, p. 271). Third places are democratic in nature (Oldenburg, 1989) whereby the sociability within these environments creates an artificial, frictionless space of interaction. Simmel (1908/1971, p. 133) states:

Inasmuch as sociability is the abstraction of association-an abstraction of the character of art or of play-it demands the purest, most transparent, most engaging kind of interaction-that among equals. It must, because of its very nature, posit beings who give up so much of their objective content, who are so modified in both their outward and their inner significance, that they are socially equal.
For sociability within third places, the content of those conversations is much less important than the act of conversing with others in a status neutral place (Oldenburg, 1989; Simmel, 1908/1971).

Previous literature on professional knowledge networks and eNoP have viewed off-topic discussion forums (sociability forums) within these sites as noise distracting users from the exchange of resources and a means to possibly drive members away from the site (Phang, et al., 2009; Preece, 2000; Preece & Schneiderman, 2009). Phang et al. (2009), for example, discuss the importance of sociability in terms of purposive association but not sociability in terms of play-form association (Simmel, 1908/1971). Their definition of sociability is defined in relation to the common purpose (knowledge-sharing) of the electronic social structure. They still adhere to the general idea that it is “necessary to maintain a coherent focus in members’ interaction within the intended knowledge domain” (Phang, et al., 2009, p. 728).

I argue that off-topic forums have the potential to be virtual third places and participation within these virtual third places has the potential to increase participation on the practice side of the eNoP. The owners of www.stackoverflow.com (eNoP of software developers) state the following concerning their third place sections within their site:

But I think a web-based real time chat system like Campfire could offer that informal public gathering third place—a space for people who love the topic to meet, discuss, and collaborate in a different way. It would foster community, and be complementary to both strict Q&A, and meta-discussion (Downloaded from http://tinyurl.com/38chdvc on January 15, 2013).

I further argue that participation within the third place portions of an eNoP may create a symbolically constructed place of significance instead of ‘just another’ knowledge-sharing eNoP. Furthermore, when individuals associate a place as a significant place in their lives, they tend to form an intense loyalty to that place (Belk, 1992; Rosenbaum, 2006; Sherry, 1998). In addition to forming an intense loyalty to that place, I further argue that individuals may form an
emotional attachment (affective place attachment) to that place and, possibly, define a portion of himself or herself in relation to that place (place identity). Both of these concepts may lead to the idea that a particular place may become significant in an individual’s life (Lewicka, 2011; Scannell & Gifford, 2010; Wynveen, et al., 2012).

**Affective Place Attachment**

The term place attachment has been used as an umbrella concept in the literature to describe any dimension related to the intensity of the human-place bond (Low & Altman, 1992). Within this broad concept, place attachment can operate at the individual, group, or community levels (Giuliani, 2003). Wynveen et al. (2012) note that as particular places become more meaningful to individuals, those individuals develop a strong affective attachment to those places. Affective attachment may be specifically defined as the emotional bond that an individual forms with a specific place (Milligan, 1998). Place attachment parallels but is ultimately distinct from attachment to people (Fullilove, 1996). It is often through personal attachments that an individual forms an emotional attachment to a place (Milligan, 1998), but the affective attachment to a place is different from attachment to people, groups and communities. Milligan (1998) argues that the more meaningful the interactions that occur in a specific place, the greater the affective place attachment.

Tuan (1977) argues that it is the emotional significance that physical places take that transforms them into meaningful places. Social interactions and cultural processes are important aspects of this affective attachment to a specific place (Milligan, 1998; Tuan, 1977). Milligan (1998, p. 28), for example, states:

> Every interaction bestows some form of meaning on its stage, transforming that site into a known place, but when the interaction involves a higher degree of meaning, whether or not that meaning is perceived at the time, the place becomes the site of place attachment.
Tuan (1977) also argues that a setting does not become a meaningful place until lived experiences and social interactions take place in the specific setting. Through social interactions and discourse between individuals within a specific setting, meanings form creating an affective person-place attachment of varying intensity (Wynveen, et al., 2012). Milligan (1998) similarly argues that the emotional bond formed between an individual and a place is related to the interactional past (memories of interactions) and to the interactional potential (perception of likely future experiences).

**Place Identity**

Place identity is a cognitive structure contributing to self-categorization processes in relation to themes of the self, others and the environment (Fried, 2000; Gustafson, 2001). In essence, place identity answers identity questions such as “who am I?” in relation to answering the “where am I?” question (Cuba & Hummon, 1993; Proshansky, Fabian, & Kaminoff, 1983; Twigger-Ross & Uzzell, 1996). Proshansky (1978, p. 147) specifically defines place identity as “those dimensions of self that define the individual’s personal identity in relation to the physical environment.” Place identity is a component of self-identity (Proshansky, et al., 1983) and may increase self-esteem (Korpela, 1989), foster a sense of belongingness (Relph, 1976; Tuan, 1977), and serve as a mechanism to spread environmental specific policies and values (Cantrill & Senecah, 2001). Place identity generally requires a deep psychological investment with the environmental setting that develops through lived experiences in a specific setting (Gustafson, 2001), which may result in a symbolic extension of the self (Hummon, 1992; Proshansky, et al., 1983).

Affective place attachment and place identity are similar but distinct concepts. For example, it is possible for an individual to be affectively attached to a place without defining one’s self in
connection with a specific place (Lewicka, 2008). Fried (2000) further argues that an affective attachment to a place may be understood in terms of understanding the emotional bonds with people in the context of a specific place and not necessarily by defining oneself in relation with the place.

**Research Hypotheses**

The research hypotheses depicted in Figure 2 are premised on the idea that off-topic forums within an eNoP may constitute virtual third places. Despite Oldenburg’s (1989) argument that virtual environments may not constitute third places, literature on online games and 3D social environments suggest that virtual environments may constitute third places. Steinkuehler and Williams (2006), for instance, argue that gaming environments offer an escape from stratified daily social life, while simultaneously serving to satisfy individual’s needs for sociability, fantasy, and relaxation. They quote one of their interviewees in terms of why he/she participates in online games as saying “you go for the experience [points], you stay for the enlightening conversation” (Steinkuehler & Williams, 2006, p. 895). Moore and colleagues (2009) also argue that virtual hangouts within massively multi-player online gaming environments provide just as authentic sociability as real-life contexts. These findings are not limited to online gaming as, for example, Bruckman and Resnick (1993) report similar third place style social dynamics in MediaMOO, a virtual professional community of media researchers. Both Kendall (2002) and Soukup (2006) argue that these virtual environments provide a ‘daily refuge’ or a ‘haven’ from the demands of work and home, which is a primary function of third places. This leads to the following research conjecture:

*Conjecture 1: Off-topic forums within eNoP may constitute virtual third places*
If off-topic forums within eNoP may constitute virtual third places, then I argue that third place participation may increase participation (civic engagement) on the practice-side of the network. Previous research has theorized that third place participation increases civic engagement outside of the third place by embedding the individual within the wider social structure (Oldenburg, 1989; Oldenburg & Brissett, 1982). Tolbert et al. (2002) argue that third places provide an institutional basis for informal public life, which may create horizontal linkages in a locale and ultimately increase civic engagement. They further argue that third places are important aspects of civic communities serving to fuse together civic engagement and local capitalism (Tolbert, et al., 2002).

I argue that participation within the third place portions of an eNoP may create a symbolically constructed place of significance instead of ‘just another’ knowledge-sharing eNoP. Furthermore, when individuals associate a place as a significant place in their lives, they tend to form an intense loyalty to that place (Belk, 1992; Rosenbaum, 2006; Sherry, 1998). In addition to forming an intense loyalty to that place, I further argue that individuals may form an emotional attachment (affective place attachment) to that place and/or define a portion of himself or herself in relation to that place (place identity). Third places provide a means to create places of significance, because they provide information about people and tie people to places while simultaneously removing people from strategies of self-interest (Oldenburg & Brissett, 1982). For example, one regular contributor to the off-topic message forums within www.dreamincode.net stated the following concerning the importance of place:

after 10 years, this [off-topic forum] is still where I enjoy coming to hang out and relax. And we're not just a Q&A site, we're a community of developers. You've gotten me interested in living out of an RV and traveling, others have supported us through hard times, I've made good friends, and had great discussions. It's an important part of Dream.In.Code to me and many others…I think it should be a healthy place that makes
These types of interpersonal social interactions that happen in third places have been found to facilitate the transfer of knowledge at many different levels of analysis by creating a collectivist norm or a sharing culture (Van Den Hoooff, de Ridder, & Aukema, 2004). Third places have the potential to create this sense of collectivism by creating a symbolic place in which embedded participants may share a commitment to the common good (domain-specific practice) (Oldenburg, 1989; Soukup, 2006).

Figure 2. Third Place Participation Research Model
It is my conjecture that it is relatively easy for individuals to find alternative knowledge-sharing places among the many seemingly undifferentiated knowledge-sharing eNoP in cyberspace, but it is more difficult to find alternative places of emotional and psychological significance in the virtual world. As such, I argue that members who make identity claims with the eNoP through their third place participation and members who have greater affective place attachment (emotional attachment to a particular place) to the third place portions of the eNoP may have greater membership longevity and provide more positively rated contributions on the practice-side of the eNoP. I argue that this is the case because the third place provides individuals with a sense of wholeness and distinctiveness in addition to a sense of emotional expressiveness that cannot be easily replaced (Oldenburg & Brissett, 1982). Consequently, third place participants may have an increased propensity to be civically engaged in the wider social structure in order to ensure that the environment which contains the third place does not dissolve, which would inevitably lead to the dissolution of the third place as well (Oldenburg, 1989; Tolbert, et al., 2002). In order to be successful, however, the network requires active membership and quality contributions to the practice side of the site. As such, I hypothesize the following:

**H1a:** Participants who make identity claims with the eNoP through their third place participation will be less likely to become inactive on the practice side of the eNoP.

**H1b:** Participants who make identity claims with the eNoP through their third place participation will be more likely to contribute positively rated practice-related content.

**H2a:** Participants who have greater affective third place attachment will be less likely to become inactive on the practice side of the eNoP.

**H2b:** Participants who have greater affective third place attachment will be more likely to contribute positively rated practice-related content.

Lampel and Bhalla (2007) and Lerner and Tirole (2002) argue that status and reputation seeking are important extrinsic motivators for individuals to contribute to the public good.
Insofar as a member’s score (sum of positive votes minus sum of negative votes) in the peer-to-peer feedback system is a measure of status or reputation; this suggests that individuals are motivated to achieve as high a score as possible. Furthermore, the switching cost associated with abandoning a site where a member has invested a lot of time and energy to ‘earn’ a high score is extremely high, because that member would have to start over at another eNoP. Therefore, those members with high scores in these systems will have a greater likelihood of continuing to participate (Lerner & Tirole, 2002). This idea is one of the basics tenets behind the implementation of peer-to-peer feedback systems within eNoP and other electronic social structures (Crowston, et al., 2012; Preece & Schneiderman, 2009). Therefore, I hypothesize the following:

**H3a:** The greater a member’s score in the peer-to-peer feedback system, the less likely he/she will become inactive on the practice side of the eNoP.

**H3b:** The greater a member’s score in the peer-to-peer feedback system, the more likely he/she will contribute positively rated practice-related content.

I further argue, however, that the impact that a member’s score in the peer-to-peer feedback system will have on promoting future practice-related contributions will be qualified by site level identity claims resulting from third place participation and affective attachment to the third place portions of the eNoP. I argue that this is the case, because status attainment and maintenance in a place of emotional and psychological significance will be more important than status attainment and maintenance in ‘just another’ knowledge sharing eNoP. In other words, status-seeking behavior in a place where a member feels a sense of ‘placelessness’ whereby places are treated as interchangeable and replaceable will be different from status-seeking behavior in a place where a member has deep emotional and psychological ties to the place (Relph, 1976). This leads to the following hypotheses:
H4(a)(b): The impact that the peer-to-peer feedback system has on --- (a) maintaining active membership (b) contributing higher quality practice-related content --- will be greater for members who have greater affective place attachment to the third place portions of the eNoP.

H5(a)(b): The impact that the peer-to-peer feedback system has on ---(a) maintaining active membership (b) contributing higher quality practice-related content --- will be greater for members who make identity claims with the eNoP through their third place participation.

Research Design & Methods

I utilized a mixed method approach in order to validate the claim that the off-topic message forum within TPC represents a virtual third place (Conjecture #1) and to empirically test my specific research hypotheses (depicted in Figure 2). This eNoP has been in existence since 2001 and has over 525K registered members as of April 2011. The site contains both formal message boards where domain-specific problems are discussed (on-topic forums) related to a variety of programming languages and message boards where members may informally interact through blogs, lounges, and Facebook style walls. The specific forum conceptualized as a virtual third place is referred to as the TPC café (pseudonym) in order to maintain the anonymity of the site.

The site describes the TPC café as a “forum for discussions related to non-programming topics including: sports, current events, games, music, movies, TV, food, drink, geek related (toys & technology), debates, life events, rants, and occasionally religion and politics.” This is a place for general sociability or the play-form association. In December 2010, roughly 30% of all posts across all forums at this site came from the TPC café, so this is a very popular ‘hangout’ place for TPC members.

This site was chosen as the context for this empirical investigation for several reasons. First, TPC is similar to other large eNoP of software developers that have been in existence for long periods of time, which also have popular on-topic and off-topic forums thereby helping the generalizability of the findings. Second, this site has a rich and transparent peer-to-peer
feedback system whereby any member or guest may view the date, the post, and the members who received and gave the positive or negative vote. In this system, voting is done in a binary manner (either positive (up) or negative (down)), which is similar to other feedback systems implemented at large eNoP within the software development industry. This enabled me to compare and contrast the effect of affective place attachment within the third place portions of the site, site level identity claims resulting from third place participation, and member’s score (sum of positive votes minus sum of negative votes) within the peer-to-peer feedback system on both practice-related outcome variables. Third, many studies using and attempting to contribute to the CoP and NoP literature are using core CoP and NoP constructs to describe social dynamics in occupations that aren’t particularly skill-based or that do not include a core set of practices. Programming includes a common set of practices related to writing and debugging code and the act of writing code is largely a skill-based craft.

The data analysis involved two steps. The first step was qualitative in design in order to determine the applicability of the third place theoretical lens to explain the social dynamics in the TPC café (Conjecture #1). The qualitative data analysis involved analyzing two types of discussion threads. The first type of discussion thread involved the members actually discussing the nature of the TPC café (as the topic of discussion) and what the TPC café means to them as individual members. In order to find these types of discussion threads, I used the search utility on the site. I searched for terms such as “community,” “place,” “TPC café (pseudonym),” “café (pseudonym),” “TPC (pseudonym),” and different variations of the site name. This search process resulted in a data set of 250 comments made by roughly 75 members across 25 discussion threads. I read and analyzed these discussion threads and evaluated the responses (commentary) in terms of the eight dimensions of third places defined by Oldenburg (1989).
Evidence for (or against) the third place theoretical lens was derived from the specific, explicit comments of these 75 members concerning the TPC café (or related terms).

I then analyzed roughly 100 ‘normal’ discussion threads in the TPC café where the topic of discussion was not the TPC café (or related terms). I theoretically sampled a broad spectrum of discussion topics in order to determine the discussion norms in the TPC café and to further evaluate the applicability of the third place theoretical lens in the TPC café. Evidence of the norms and discussion practices was derived from my interpretation of the member’s discussion practices in relation to Oldenburg’s eight dimensions of third places. For example, evidence for (or against) the playful mood characteristic of third places came from my systematic observations concerning the tenor of the commentary across these theoretically sampled discussion threads. To challenge and refine my observations concerning each one of Oldenburg’s dimensions, a second academically qualified researcher analyzed a sample of roughly 35 of the same discussion threads that I analyzed and 25 different discussion threads within the TPC café. Results from these analyses are summarized in Table 6 (at the end of the next section) and discussed in detail in the following section of the study.

The second step of the data analysis involved the systematic, quantitative testing of the five hypotheses. I manually downloaded all (non-archived) off-topic discussion threads in the TPC café from March 2001 until December 31, 2010 and all (non-archived) on-topic (programming language specific) discussion threads from November 15, 2010 until December 31, 2010.1 This

1 Based on the terms of use for this site at the time of the study, no automated scripts were permitted to be used to download any data from the site. As such, in order to comply with these terms of service guidelines and the recommendations for ethical use of digital data specified by Allen et al. (2006), I used a manual data collection process. The manual download process did not put any excessive load on their servers as the collection effort was spread out over several months. The University of Hawai‘i at Mānoa Institutional Review Board approval for this study is in Appendix A.
exercise resulted in 15,980 discussion threads posted and discussed by 3,401 members.\(^2\) I then manually downloaded each of the 3,401 member’s profile pages, which included positive and negative votes within the peer-to-peer feedback system and posting activity in calendar year 2011 in order to determine whether the member remained an active contributor or not.

I used a series of cox proportional hazard models (proportional time-to-event regression models) in order to test these hypotheses. As such, the ‘lower (higher) the propensity’ or the ‘lower (higher) the likelihood’ is operationalized as a ‘reduced (increased) hazard rate’ in order to test my hypotheses. A hazard rate is interpreted in a similar manner as an odds ratio in a logistic regression. A statistically significant hazard rate less (greater) than 1.00 for an independent variable means that there is a reduced (increased) likelihood of an event occurring. It differs from a logistic regression because the dependent variable is a function of time and the event in question rather than just the event.

A cox proportional hazard model was chosen for three primary reasons. First, a cox proportional hazard model offers the ability to efficiently handle censored cases (i.e. observations without an event during the time of the study). In my data set, for example, most members do not contribute a positively rated practice-oriented contribution (roughly 85%), so only analyzing those members who contributed a positively rated practice-oriented contribution would result in biased estimators (Allison, 2010). Second, a cox proportional hazard model enables me to model time-dependent covariates using continuous-time data. I am measuring most of the variables at a single point in time (12/31/2010), so it is reasonable to assume that the effect may not be consistent across the entire observation period. Third, regression models such

\(^2\) Although the site had over 500K registered profiles/accounts as of December 2010 only a fraction of those members are active (i.e. contributed a post) at any point in time. This is similar to other eNoP and other large electronic social structures whereby most profiles are not active (Preece & Schneiderman, 2009). In my observation period, only 3,401 TPC members had any practice-related posting activity on the site between November 15, 2010 and December 31, 2010.
as logistic regression models with dichotomous dependent variables ignore the timing of the events whereas a hazard model can model the timing of the event as part of the dependent variable. This is also highly relevant in my analysis. For example, it is natural to suspect that members who contribute a positively rated contribution in the first week of 2011 will have, on average, a higher propensity to contribute a positively rated contribution relative to those members who do not contribute a positively rated contribution until the 40th week of 2011. Ignoring the timing of the event would reduce the precision of my estimators (Allison, 2010).

I ran two different sets of cox proportional hazard models. The time portion of the dependent variable in the first set of models is the length of time it took a participant to become inactive (determined as no posts within a rolling forty five day period) in the practice-related areas (programming forums) of the eNoP starting on 1/1/2011. Forty five days was chosen as the time period for inactivity, because I looked at the posting activity for several members who have been active in this site since the beginning (2001 through 2010) and noticed that none of those selected members disappeared (i.e. had no posts) from the site for more than forty five days. In these models, the binary event being modeled is becoming inactive on the practice-side of the eNoP. The time portion of the dependent variable in the second set of models is the duration of time between 1/1/2011 and a member’s first positively rated practice-related (programming) contribution (determined by another member rating the contribution as positive within the peer-to-peer feedback system) in the first 275 days in calendar year 2011. In these models, the binary event being modeled is contributing a positively rated practice-related contribution. The first set of hazard models is used to test the top model in Figure 2 and the second set of models is used to test the bottom model in Figure 2.
The three core independent variables used in both sets of cox proportional hazard models are each member’s score in the peer-to-peer feedback system (score in P2P feedback system), affective place attachment to the third place portions of the eNoP (affective third place attachment), and site level identity claims made by third place participants (third place identity claims). Each of the 3,401 member’s score in the peer-to-peer feedback system was determined using TPC’s score keeping formula. At TPC, a member’s score at a given point in time is determined by adding the total positive votes that a member received and subtracting the total number of negative votes a member received. This was calculated as of 12/31/2010 for each member in my sample.

The affective third place attachment variable measures the emotional bond that a member has had with the eNoP through participation in the TPC café. Much of the affective place attachment literature use survey instruments (Giuliani, 2003). In contrast, I used a proxy for affective third place attachment that was consistent with the definition but could be determined using my archival data collection methodology. Milligan (1998) argues that the more meaningful the interactions that occur in a specific place, the greater the affective place attachment. As such, I am trying to capture how meaningful the interactions an individual member has had within the TPC café.

The specific operational definition of affective third place attachment used in this study is derived from Sykes et al.’s (2009) definition of valued network centrality, which measures the amount of resources controlled by a specific vertex in the network. In my study, valued network centrality refers to the amount of affective resources that a node in the network controls based on its structural position within the TPC café. To determine the affective ties between members within the TPC café, ties derived from Marsden and Campbell (1984) and Gilbert and Karahalios
(2009) were used in order to determine the meaningfulness of the relationship between two nodes within the TPC café. Affective ties between two nodes within the TPC café were determined by relationship intensity, duration, intimacy, and emotional support. Table 4 contains the specific measures associated with each one of these factors. In this sense, affective place attachment represents places “within which interpersonal, community, and cultural relationships occur, and it is to those social relationships, not just to place qua place, to which people are attached” (Low & Altman, 1992, p. 7). A place may become meaningful and significant through the relationships formed and lived experiences that happen in the specific setting (Low & Altman, 1992; Milligan, 1998; Wynveen, et al., 2012).
Table 4. Specific Measures for Each Component of Affective Third Place Attachment

<table>
<thead>
<tr>
<th><strong>DIMENSION OF AFFECTIVE PLACE ATTACHMENT</strong></th>
<th><strong>OPERATIONAL DEFINITION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>Number of TPC café discussion threads which two nodes both participated</td>
</tr>
<tr>
<td>Aggregate number of ‘lived’ experiences between two members in the TPC café</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>Days since first communication in the TPC café between two nodes measured from 12/31/2010</td>
</tr>
<tr>
<td>Length of time two members in the TPC café new one another</td>
<td></td>
</tr>
<tr>
<td>Intimacy</td>
<td>Days between first and last communication in the TPC café between two nodes using 12/31/2010 as the end point</td>
</tr>
<tr>
<td>Strength of relationship between two members in the TPC café</td>
<td></td>
</tr>
<tr>
<td>Emotional Support</td>
<td>Number of TPC café discussion threads concerning emotional and personal topics such as birthday announcements, personal achievements, marriage or child birth announcements, and so on which two nodes both participated. Determining these threads was a manual effort based on thread titles.</td>
</tr>
<tr>
<td>Emotionally meaningful interactions between two members in the TPC café</td>
<td></td>
</tr>
</tbody>
</table>

The resulting formula for affective third place attachment is the following:

\[
\text{For each vertex } (j) = \left(\frac{1}{1-n}\right) \sum ((\text{Intensity})_{ij} + (\text{Duration})_{ij} + (\text{Intimacy})_{ij} + (\text{Emotional Support})_{ij})
\]

Neither Marsden and Campbell (1984) nor Gilbert and Karahalios (2009) theorize that any one factor is more important than another, so I weighted each equally in my operational definition. As such, each term in the above equation was standardized before aggregation in order to account for the different scales associated with each term in the formula.

The higher the value means the greater the affective third place attachment in this operational definition. A higher number means that an individual member has had more emotionally significant relations with other members, more lived experiences with other members, and longer and more intense relationships with other members in the TPC café. The greater the affective and emotional attachment that a member has with a diverse set of other members within a specific setting (place), the greater the affective place attachment (Wynveen, et al., 2012). The social relationships with other members in this third place, the third place social resources
controlled by a specific member, and the affective relationships with other members provide the lived experiences that emotionally tie a member to the site and make the site a meaningful (third) place (Gustafson, 2001). The greater the number, the more meaningful the interactions a member had relative to the other third place participants.

The third place identity claims variable was operationalized as a binary variable determined in one of two ways. First, a TPC café participant was considered to identify with the place if he/she purchased a yearly or a monthly membership with the site. These members get to display a custom badge containing the site’s initials next to each one of his/her posts. By identifying himself or herself as a loyal supporter of the eNoP, he/she is making an identity claim in relation to the eNoP. Second, members may customize their membership title within their profile, which also gets displayed next to each one of his/her posts. If a TPC café participant customized his/her membership title to include the site’s initials, the word ‘TPC café’ (pseudonym), or any variant thereof, then that member is considered to have made an identity claim with the eNoP via their third place participation. With this operationalization, I am not trying to indicate if one member’s third place identity claim is stronger than any other member, but instead simply identifying which members have made some type of identity claim in relation to the eNoP via their third place participation.

Within the eNoP literature, a core finding is that the more structurally embedded a member is on the practice-side of the network, the more likely that he/she will contribute content (Chiu, et al., 2006; McLure Wasko & Faraj, 2005; Whelan, 2007). This has been argued to be the case, because those members with a high degree of network centrality (common measure of structural embeddedness) are more likely to develop a habit of participation and are more likely to comply with the site’s norms and contribution expectations (McLure Wasko & Faraj, 2005). In order to
control for this possible alternative explanation, I am controlling for the practice-related configuration of relationships determined by a member’s degree centrality. Degree centrality was chosen, because this is the measure used by McLure-Wasko and Faraj (2005).\(^3\) Degree centrality is a measure of how many connections a member has with other members on the practice-side of the eNoP. In this case, a simple unidirectional matrix was constructed whereby if two dyadic pairs of members participated in a common programming related discussion thread (digital trace data), a 1 was placed in that cell (otherwise the cell contained a 0) (Howison, Wiggins, & Crowston, 2011). This measure determines how many practice-related relationships a node in the network has irrespective of the number of posts (McLure Wasko & Faraj, 2005). All independent variables and the market degree centrality control variable were calculated as of 12/31/2010 23:59. Table 5 contains a detailed list of all variables used in the quantitative analysis and a description of the operational definition of each variable.

\(^3\) Other measures of centrality such as betweenness, eigenvector, and closeness were either not significant in all of my models or were significant with inconsequential hazard rates (i.e. hazard rate not materially different from 1.00).
Table 5. Summary of Operational Definition of Variables

<table>
<thead>
<tr>
<th>VARIABLE NAME</th>
<th>OPERATIONAL DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Active Member</td>
<td>Binary (0 or 1) variable indicating if a member became inactive on the practice-side of the eNoP during the first 275 days of calendar year 2011. Inactivity was determined as having no practice-related contributions for a rolling 45 day period. All censored cases have a time value set to 275 days.</td>
</tr>
<tr>
<td>Time (first set of hazard models)</td>
<td>The number of days (and fractions thereof) starting from 12/31/2010 23:59 until an individual became inactive on the practice-side of the eNoP. All censored cases have a time value set to 275 days.</td>
</tr>
<tr>
<td>Positively rated practice-related contribution</td>
<td>Binary (0 or 1) variable indicating if a member received a positively rated practice-related contribution determined by a peer positively voting the contribution within the peer-to-peer feedback system during the first 275 days of calendar year 2011.</td>
</tr>
<tr>
<td>Time (second set of hazard models)</td>
<td>The time is determined by the days (and fractions thereof) starting from 12/31/2010 23:59 until the member’s first positively rated practice-related contribution (any programming forum) in the first 275 days of calendar year 2011. All censored cases have a time value set to 275 days.</td>
</tr>
<tr>
<td><strong>Hypothesized Independent Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Affective Third Place Attachment</td>
<td>For each vertex ((j) = (1/(1-n))\sum((\text{Intensity})<em>{ij} + (\text{Structural Similarity})</em>{ij} + (\text{Duration})<em>{ij} + (\text{Intimacy})</em>{ij} + (\text{Emotional Support})<em>{ij} + (\text{Social Similarity})</em>{ij}))</td>
</tr>
<tr>
<td>Third Place Identity Claims</td>
<td>Binary (0 or 1) variable indicating whether a TPC café participant purchased a site membership thereby displaying a custom badge next to each one of his/her posts or whether a TPC café participant customized his/her profile to include the site initials or word ‘TPC café (pseudonym)’ in his/her membership title.</td>
</tr>
<tr>
<td>Score in P2P feedback system</td>
<td>This represents a member’s score in the peer-to-peer feedback system as of 12/31/2010 23:59, which is calculated as the sum of total positive votes minus the sum of total negative votes</td>
</tr>
<tr>
<td><strong>Control Variable</strong></td>
<td></td>
</tr>
<tr>
<td>Practice-related degree centrality</td>
<td>Degree centrality measured by common participation between two dyadic pairs of members in a programming related discussion thread between November 15, 2010 and December 31, 2010 (unidirectional). A straight forward social network matrix containing all 3,401 members was constructed with a zero indicating that there was no common participation in any programming thread and a 1 indicating that there was common participation.</td>
</tr>
</tbody>
</table>
Other control variables such as prior commitment to the site (number of posts per day), years programming (determined by a data element in each member’s profile), and reciprocity (number of give help posts greater than the number of get help posts on any practice-related forum) were considered based on their importance from previous literature but were ultimately excluded from the final analysis, because they had excessively high variance inflation factors, were not statistically significant, and/or did not have a meaningful impact on the underlying hazard ratios.

Qualitative Results

This section discusses the applicability of the third place theoretical lens to the TPC café (Conjecture 1). No URLs are included with the quotations in order to maintain the anonymity of the site, and the names of the members involved have been changed to aliases as well. This section is organized around the eight defining characteristics of third places but the characteristics are inter-related, so many of the quotations provide evidence of more than one dimension. As such, I use italics to highlight the other dimensions of third places that a particular quote may be providing evidence for or against. Table 6 at the end of this section summarizes the findings.

Home Away From Home

Oldenburg (1989) argues that a third place should offer a warm atmosphere fostering a feeling of being at ease and a sense of rootedness, which is referred to as a home away from home. Such feelings of rootedness “help create a shared sense of home, and with it the sense of support and warmth that some folks may very well lack in their own ‘real world’ households and work places” (Steinkuehler & Williams, 2006, p. 900). When discussing the importance of off-topic social interactions and the TPC café more generally, one regular visitor stated that these types of interactions and the TPC café provide an “escape from the bleak nothingness that is my
office,” which is a primary function of third places (escape from home (first place) and work (second place)). For many members, the TPC café represents the core setting for informal public life and sociability within the eNoP. The TPC café provides a balance between providing an escape (conditions external to the TPC café) and the conversations that are unique to the TPC café (conditions internal to the TPC café). One participant cogently stated the following:

oh, ok, I get it, its a place for everyone to be random like that...ok, that makes sense now...I HAVE FOUND A HOME lol...and why does that not surprise me on the caffeine thought...but that's what caught my eye and brought me here :3

Oldenburg (1989) discusses the importance of being able to participate in conversations without fear of being excluded and without the social obligations (neutral ground) and political correctness that come with the home and work environments. As the previous quote demonstrates, participation in the third place roots this particular member within the TPC café.

**Conversation**

The core activity in third places is conversation (Oldenburg, 1989; Oldenburg & Brissett, 1982). The act of conversing offers opportunities for experiences and the formation of relationships that may otherwise be unavailable outside of the third places (Oldenburg & Brissett, 1982). Within an online discussion forum, communicating via discussion threads (responses and replies in a give and take format) is the equivalent of verbal conversations in physical settings. However, conversation, the dominant activity of the third place, is “not ‘special’ in the eyes of its inhabitants, it is a taken-for-granted part of their social existence” (Oldenburg & Brissett, 1982, p. 270). One regular participant within the TPC café stated the following:

I lurked a while before I started heavily posting. I didn't know what the [TPC café] was and when I found it, I lurked for a while and learned that I was entering at my own risk. I don't really think it matters what you do, you will always have people that are unhappy and will move on because their feeling were hurt. It is a place to vent, be sarcastic, be humorous, troll, laugh, or hell, streak and throw confetti. I personally look forward to
seeing what's up there and sometimes feel deprived when there's not a lot of topics to read through.

The act of conversing is more important than the actual topics being discussed in the TPC café as evident by the diversity of topics being discussed. However, the play-form of association, as manifest in conversations (discussion threads) in the TPC café, is subject to proper form (normative behaviors) just like any other form of association (Simmel, 1908/1971). Many newer participants often start posting in the TPC café without an understanding of the posting norms or the style of the group and are often met with awkward silence or excessively unpleasant responses to their posts. One active member stated the following after a relatively new member was upset about getting harsh commentary regarding one of his/her posts:

Welcome to the [TPC café] my friend… obviously you’re too noob⁴ to know what this forum is about so I figured I would entertain you…

This quote demonstrates that the TPC café is designed to be entertaining (*playful mood*) and, despite the overly negative treatment of this particular member, he/she is still welcome to participate so long as he/she posts according to the TPC café norms and the style of the group. The word ‘friend’ in the above quotation may be used sarcastically here, but all participants are considered ‘friends’ in conversations within the TPC café. In this case, the term friend generally means welcome participants (*accessibility and accommodation*). For instance, I often observed a member getting insulted in one thread and then participating in a different thread with similar participants only a few hours later, and he/she would be a welcome addition to the new conversation as if the previous discussion did not happen (*neutral ground*). This is consistent with Oldenburg’s (1989) conceptualization of third places as environments where members should be free to converse about any topic without future social obligations (*neutral ground*) or fear from exclusion (*accessibility and accommodation*).

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⁴ Noob is short for newbie, which refers to a new member or a new participant.
Accessibility and Accommodation

Accessibility and accommodation refers to the idea that third places should be easy to access and conversations should be happening at almost any time of the day or evening (Oldenburg, 1989). A simple analysis of the timing of posts in the TPC café reveals that there is discussion at almost all hours of the day and night. During my observation period, there were only two members that I identified as being permanently banned from participating in the TPC café. However, a moderator sometimes needed to ban a member for a few hours or a day, but then that member would be allowed back in the TPC café and there was subsequent posting activity from that member. I generally observed these temporary bans in discussion threads related to religion, politics or other opinion oriented topics. A regular participant stated the following concerning the accessibility of the TPC café:

At [TPC], we have people of all ages, backgrounds, and interests. The [TPC café] should be a place where anyone can come to converse and hang out without having their topics degrade into 4chan\(^5\) (not saying the topics won't or shouldn't change course in the conversation).

Some discussion threads in the TPC café may get fairly contested (emotional and animated), which often results in some heated, personal exchanges or attacks between members. Yet, members appeared to have short memories and/or not hold grudges based on these types of heated interactions. For example, after a long exchange of name calling and personal insults between member Giarc823 and noj123, Giarc823 said the following: “Merry Christmas all! And yes, that even includes noj123.” I rarely observed a member leaving the TPC café permanently due to an animated discussion thread. What was said in TPC café conversations stayed in the TPC café and didn’t carry-over to other discussion threads, because the TPC café is a place that is accessible to all (most) members of the eNoP.

\(^5\) 4chan is an image board website where users can post anonymously. Discussion threads on this site often result to the lowest common denominator of trolling and name calling.
Regulars

A defining characteristic of third places is the presence of regular participants and the presence of regulars creates the unique atmosphere of the third place making it a ‘great good place’ (Oldenburg, 1989). Within the TPC café, a core group of 65 participants contributed roughly 62% of the discussion replies within this forum between March 2001 and December 2010.⁶ Even though the conversations between regulars were heated and intense at times, this group of regulars genuinely seemed to enjoy each other’s company. Talking about the regulars, one regular participant stated the following:

Oh, please! I’m as much a stranger in the [TPC café] as Norm was at the bar on Cheers.⁷
And Let’s face it…you’re [sabrbfloe19] not exactly a nerd board newbie, either.

Although many members did not know each other outside of the virtual environment, they were still known to each other. The following quotation illustrates the unique environment (home away from home and playful mood) and the importance of interactions between regular participants:

A large part of this community is built upon our regulars. It is what makes us, [TPC], unique. I have better social interactions with others in the [TPC café], than when we meet in the programming forums

Some of the regular participants, however, were not as open to newer members joining conversations (accessibility and accommodation), especially when the topics were heated and the newer members did not understand the style of the group and/or the norms associated with participating in the TPC café.

Based on data in the peer-to-peer feedback system as of 12/31/2010, the average score in the peer-to-peer feedback system for the core group of regular participants in the TPC café was 253

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⁶ The remaining 38% of posts in the TPC café were spread out over 3,800 different members.
⁷ Cheers was a popular television program in US in the 1980s about a local Bar in Boston, MA and a group of regular bar patrons. Norm was one of the bar’s regular patrons who contributed to the unique environment of the pub.
relative to an average of 15 for the other active members, which suggests that the TPC café might be a place for the ‘elite’ members of the eNoP to hang out. This is contrary to Oldenburg’s (1989) notions of accessibility and accommodation. One relative newer member stated the following after a seemingly innocuous post was met with overly harsh negative commentary from many regular participants:

ok, did I apparently do something I should not have done with this thread?? like not post it in the right forum or something?? for that image reply strikes me as having done something wrong...

Many members had to withstand a little ‘hazing’ or make friends with a regular in order to be accepted into the third place. For example, in order to stop the ridiculing of a newer member, one regular participant stated “He’s a cool dude…He doesn’t come on here much so he isn’t fully aware of [TPC café] culture.” This is inconsistent with Oldenburg’s (1989) idealized third places, but probably consistent with actual third place dynamics in most online and offline third places. Very few places (both online and offline) are truly status neutral and completely accepting of new members immediately (Steinkuehler & Williams, 2006).

**Leveler**

Oldenburg (1989) argues that third places should be status neutral environments. The ideas of regulars and a leveling environment, however, are somewhat contradictory, because regular participants are probably of a higher-status than transients or newer members even if there is no formal way of measuring status within the TPC café. This may be the case for both online and offline third places as regulars have embedded themselves within the third place through repeated, social interactions, which probably gives them a higher-status in these particular settings. Additionally, the TPC café is a moderated forum, which creates further status differences between members. The moderators become higher in status than the ordinary

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8 Based on the 3,401 member profiles downloaded for the quantitative analysis section.
participants, because they ultimately choose what topics get discussed within the forum (may close and/or reopen threads) and which participants get temporarily (or permanently) banned from the TPC café. For example, one participant stated the following concerning the use of moderators in the TPC café:

I had a harder time with the idea of [TPC café] moderation. I remember, not long ago, a general consensus that the [TPC café] had gotten too sterilized, too politically correct... and a unofficial agreement was reached that we should all dig a little deeper, push that extra inch, and rid the [TPC café] of the PC (political correctness) monster. Mission accomplished. Has it gone too far recently? Perhaps. But I fear that starting the wheels of the PC machine in motion again will set us right back where we were before.

Neutral Ground

Third place conversations are supposed to happen on neutral ground, meaning the conversations should be free from future social obligations and political correctness (Oldenburg, 1989). One participant pontificated that “I don’t want to see it [TPC café] degraded to 4chan, but I also don't want to see it become real life... where you can't say anything off-kilter without people making a fuss.” Just because a participant may have been flamed\(^9\) in one discussion thread did not mean the TPC café became off limits to that participant. In general, “if you can’t take the flame, don’t post the comment [in the TPC café].” Occasional flaming and going off point from the intended topic is part of the unique atmosphere (*playful mood*) associated with the TPC café. A regular participant stated the following concerning a conversation that went far astray from its intended purpose:

Quite. Look, you're not getting the reaction you expect? Welcome to the joy of open forums. Here's the deal, you don't get to control how people will react to your post, how they will respond, or how a thread might veer so far from the original intent as to be unrecognizable.

\(^9\) To flame is to interact in a hostile manner. This term generally includes profanity induced tirades directed towards certain individuals.
**Playful Mood**

Frivolity, wit, humor, inconsequential banter, light-heartedness and so on represent the tone of the conversations in third places (Steinkuehler & Williams, 2006). Oldenburg (1989) argues that seriousness is the downfall of many potential third places. The tone of the TPC café that is set by the regular participants (*regulars*) is often sarcastic and humorous in nature. For example, one TPC café participant said the following regarding the tone of the TPC café after a newer member was not receiving the desired feedback on a given thread “You posted this topic in the [TPC café]. Most people here aren’t serious.” Serious conversations concerning politics and religion sometimes happen, but most of the conversations I observed were not serious, intellectual discussions. When discussion threads became excessively serious, I often observed a regular member attempt to lighten the mood by posting a joke or something humorous in the thread. Furthermore, based on the published mission statement of the TPC café, the conversations are designed to be light-hearted, even if the topics themselves may be serious.

In the TPC café all participants may encounter the sarcastic banter of regular participant hlots123 whether the participant is a high-status member, a regular TPC café participant, or a relatively low-status newer member (*neutral ground* and *leveler*). For example, hlots123 often makes the comment “nobody likes you” in order to set the tone of the TPC café. He may sometimes literally mean this, but, more often than not, he seems to be making this comment because it provides a unique atmosphere to the TPC café (*home away from home*) and it creates a relatively *status neutral* environment. For example, one member stated the following:

I used to like the [TPC café]. Our resident latino Sloth [hlots123] made me laugh most of the time with his ways. Not having an off-topic area is taking the [T] out of [TPC]. This site is fun to use *because* of the community.
**Low Profile**

Third places are supposed to be ordinary and homely without pretension (Oldenburg, 1989). In December 2010, roughly 30% of all posts at this site came from the TPC café, so this is a very popular hangout place for members. The TPC café, however, still maintains a relatively low profile within the overall eNoP. TPC is still an eNoP focused on programming related topics and the highest profile sections of the site are related to the practice of programming. However, despite the low profile, it is still an important mechanism to establish a bond between the members and the eNoP (place). One TPC café participant stated the following:

This site is great in that it has all the flavors of a social site but with the ability to never be a part of it. Anyone can jump into their favorite programming forum and never leave it. But then there are those that prefer the non programming-specific forums that just like the sporadic array of topics.

The low profile nature of the TPC café, however, does not diminish how meaningful the member-place bond that happens in the TPC café can be. Another regular TPC café inhabitant stated the following concerning some proposed modifications to the TPC café:

My first reaction to changes in the [TPC café] was not a good one. I was immediately on the defensive... that's MY [TPC café], that's MY home, that's MY precious. Anyone who spends hours wandering the dark, dank seediness of the coffee parlor could eventually become the Gollum.

Members get deeply attached to the TPC café as an important place in their lives (i.e. “MY [TPC café], MY home, MY precious”). This participant is not discussing the attachment to the other people or to the community, but is instead discussing the attachment to the third place (the TPC café). This is her place where she has been a member for over 10 years, where she identifies a part of herself through the TPC café (place-identity) and where she has a deep affective attachment (affective place attachment).
Table 6. Third Place Dimensions and Evidence of Applicability in the TPC café

| Neutral ground (minimal social obligations) | “I don’t want to see it [TPC café] degraded to 4chan, but I also don’t want to see it become real life... where you can’t say anything off-kilter without people making a fuss” |
| Leveled (status neutral environments) | There seems to be an "insider" (regulars) versus "outsider" (newbies) dynamic in the TPC café, suggesting that it may not be status neutral. Moderating the TPC café creates a status difference between the moderators and the general discussants. All members are subject to some degree of ridicule: “Well this is the [TPC café], where many a Man has entered but very few leave as Men.” |
| Conversation (verbal interactivity is the central activity) | The TPC café “is a place to vent, be sarcastic, be humorous, troll, laugh, or hell, streak and throw confetti. I personally look forward to seeing what's up there and sometimes feel deprived when there's not a lot of topics to read through.” |
| Accessibility and accommodation (easy to access) | The average reputation score of the regulars is roughly 253 (as of 12/31/2010) relative to an average of 15 for the other members, which suggests that the TPC café may be a(third) place for high-status members “At [TPC], we have people of all ages, backgrounds, and interests. The [TPC café] should be a place where anyone can come to converse and hang out without having their topics degrade into 4chan (not saying the topics won't or shouldn't change course in the conversation).” |
| Regulars (frequent participants) | A core group of 65 participants contributed roughly 62% of the discussion replies within this forum between March 2001 and December 2010 “Welcome to the [TPC café]. Seriously, go read a few threads here. Read the one where they actually shame a person into leaving the forum (with very good reason, of course). Then understand that none of them [TPC café regulars] give two shits about being nice or polite. Grow a thicker skin and stop caring if you plan on spending any time in the [TPC café].” |
| Playful mood (laughter and wit) | “Which is why I think the [TPC café] speaks for itself. It seems that people want a place that doesn't have to be a learning experience. Well... other than, learning when to stop provoking sloth123 and B9D123.” |
| Low profile (homely without pretension) | "This site is great in that it has all the flavors of a social site but with the ability to never be a part of it. Anyone can jump into their favorite programming forum and never leave it. But then there are those that prefer the non-programming-specific forums that just like the sporadic array of topics" |
| Home away from home (warm atmosphere fostering feelings of being at ease) | "oh, ok, I get it, its a place for everyone to be random like that...ok, that makes sense now...I HAVE FOUND A HOME lol...and why does that not surprise me on the caffeine thought...but that's what caught my eye and brought me here :3" |
Summary

The objective of this section was to demonstrate the applicability of the third place theoretical lens to the TPC café (Conjecture 1). For the most part, this qualitative analysis demonstrates that Oldenburg’s (1989) concept of third places is applicable to the TPC café even though there is some evidence which questions how status neutral the TPC café really is. There are regular participants, a unique and entertaining atmosphere (playful mood), a low profile, relative open access to all members of the eNoP, a comfortable atmosphere promoting feelings of being at ease in conversations (home away from home), and a general escape from the work and home environments. Although not a physical place, it fits with the idea developed by Saunders et al. (2011) that place may be conceptualized as psychological states and perceptions of meanings rather than with geography and physical locations. Many of the regular TPC café participants have a deep connection to the eNoP as a significant place in their lives and have a strong desire to see the eNoP succeed. One regular TPC café participant stated:

When I first joined I knew [TPC] had tons of potential, and I wanted to do everything I could to make it a kick a** place to come and hang out with other programmers, and a great place for new programmers to find the help they’re looking for.

This qualitative analysis revealed that TPC is a broad social structure that includes a vibrant third place in addition to rich forums designed to promote the transfer of programming knowledge, information and advice. However, this qualitative analysis was not designed to determine if these third place forums are distractions from the practice side of the eNoP as the previous literature suggests or if these third place forums increase civic engagement (practice-oriented contributions) on the practice side of the eNoP. The next section empirically evaluates whether affective third place attachment and site level identity claims from third place participants impact practice-related contributions.
Quantitative Results

All of the hypotheses shown in Figure 2 were tested using the following cox proportional hazard model (all interaction effects are excluded from this equation for ease of display):

\[ h_i(t) = \lambda_0(t) \exp(\beta_1X_{i1} + \beta_2X_{i2} + \beta_3X_{i3} + \beta_4X_{i4}) \]

where the hazard \( h \) for the \( i \)th individual is a function of four covariates ((\( x_{i1} \)) affective third place attachment, (\( x_{i2} \)) third place identity claims, (\( x_{i3} \)) score in the P2P feedback system, and (\( x_{i4} \)) market degree centrality). \( \lambda_0(t) \) is an unspecified baseline hazard function for an individual whose covariates are all equal to zero. The time \( t \) and hazard \( h \) variables vary depending on which hypotheses are being tested (see Table 5 for details). The assumption of proportionality (effect of a covariate is the same at all points in time) is violated for the third place identity claims (\( x_{i2} \)), score in the P2P feedback system (\( x_{i3} \)) and market degree centrality (\( x_{i4} \)) variables in many of the models.\(^{10}\) To account for this assumption violation, I modeled these three factors as time-dependent covariates as opposed to time-independent covariates (Allison, 2010). When the assumption of proportionality was not violated, the time interaction was not included in the model. The interaction of each place variable and the score in the peer-to-peer feedback system variable was each tested separately using a three way interaction with time \( t \), due to the assumption of proportionality violation for at least one of the variables involved in the interaction.

The partial likelihood estimator used in the cox proportional hazard model requires that no two events occur at exactly the same time. In my models, however, the inactivity (membership longevity) models had 400 tied observations (not including the 112 censored cases) and the positively rated practice-related contributions models had 2 tied observations (not including the

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\(^{10}\) In models where the assumption of proportionality is violated, those models are testing the average effect over the range of times observed in these data (Allison, 2010).
In order to account for these tied observations, I used the exact method, which assumes that there is a true (exact) but unknown ordering for the event times. Given the fact that no two members are likely to become inactive at exactly the same time and contributions are not likely to be uploaded to the eNoP at exactly the same time, using an algorithm that considers all ordering possibilities for tied data points is the most reasonable approach.

Table 7. Descriptive Statistics and Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>MIN</th>
<th>MAX</th>
<th>VIF</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Affective Place Attachment</td>
<td>0</td>
<td>3.68</td>
<td>-0.57</td>
<td>80.18</td>
<td>1.38</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Third Place Identity Claims</td>
<td>0.08</td>
<td>0.27</td>
<td>0</td>
<td>1</td>
<td>1.38</td>
<td>0.42***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1s = 3,121 1s = 280</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Score in P2P Feedback System</td>
<td>0</td>
<td>-0.67</td>
<td>22.90</td>
<td>1.58</td>
<td>0.41***</td>
<td>0.38***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Market Degree Centrality</td>
<td>4.34</td>
<td>20.29</td>
<td>0</td>
<td>467</td>
<td>1.41</td>
<td>0.12***</td>
<td>0.36***</td>
<td>0.48***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 7 shows the descriptive statistics and the correlation matrix for the four independent variables used in these models. Multi-collinearity between the independent variables was assessed using the variance inflation factors (VIF) (also displayed in Table 7). All variance inflation factors were between 1.38 and 1.58, which are substantially lower than the common cutoffs of 4 or 10 (O'Brien, 2007). Therefore, multi-collinearity was not an issue with these four independent variables.
Table 8. Models Testing Hypotheses Related to Membership Inactivity

<table>
<thead>
<tr>
<th></th>
<th><strong>Model 1</strong></th>
<th><strong>Model 2</strong></th>
<th><strong>Model 3</strong></th>
<th><strong>Model 4</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parameter Estimate</td>
<td>Hazard Ratio</td>
<td>Parameter Estimate</td>
<td>Hazard Ratio</td>
</tr>
<tr>
<td>Affective third place attachment</td>
<td>-0.04***</td>
<td>0.96</td>
<td>-0.03***</td>
<td>0.97</td>
</tr>
<tr>
<td>Third Place Identity</td>
<td>-0.56***</td>
<td>0.57</td>
<td>-0.26**</td>
<td>See Table 9</td>
</tr>
<tr>
<td>Score in P2P Feedback System</td>
<td>-0.29***</td>
<td>0.75</td>
<td>-0.57***</td>
<td>See Table 9</td>
</tr>
<tr>
<td>Market Degree Centrality</td>
<td>-0.04***</td>
<td>0.96</td>
<td>-0.07***</td>
<td>See Table 9</td>
</tr>
<tr>
<td>(Third Place Identity)*(Days Until Inactive)</td>
<td>-0.004***</td>
<td>See Table 9</td>
<td>-0.003**</td>
<td>See Table 9</td>
</tr>
<tr>
<td>(Score in P2P Feedback System)*(Days Until Inactive)</td>
<td>0.002***</td>
<td>See Table 9</td>
<td>0.0003***</td>
<td>See Table 9</td>
</tr>
<tr>
<td>(Market Degree Centrality)*(Days Until Inactive)</td>
<td>0.0002***</td>
<td>See Table 9</td>
<td>0.0003***</td>
<td>See Table 9</td>
</tr>
<tr>
<td>(Affective third place attachment)<em>(Score in P2P Feedback System)</em>(Days Until Inactive)</td>
<td>0.00004**</td>
<td>See Table 10</td>
<td>0.00004**</td>
<td>See Table 10</td>
</tr>
</tbody>
</table>

Observations: 3401 3401 3401 3401 3401 3401 3401 3401
Censored: 112 112 112 112 112 112 112 112
AIC Without Covariates: 45,180.45 45,180.45 45,180.45 45,180.45
AIC With Covariates: 44,203.86 44,133.41 44,138.94 44,135.32
Likelihood Ratio: 984.58 (4 df)*** 1,061.04 (7 df)*** 1,055.50 (7 df)*** 1,057.12 (6 df)***
Score: 491.83 (4 df)*** 513.08 (7 df)*** 512.29 (7 df)*** 492.81 (6 df)***
Wald: 438.48 (4 df)*** 456.39 (7 df)*** 463.61 (7 df)*** 446.61 (6 df)***

Conclusion: Support for H1a, H2a, & H3a Support for H1a & H2a. Support for H3a in beginning of observation period but not at the end of the observation period Support for H1a, H2a, H3a, & H4a Support for H1a, H2a, H3a, & H5a

*Significant at 0.10, ** Significant at 0.05, *** Significant at 0.01
Inactivity on the Practice Side of the eNoP

These are the hypotheses depicted in the top section of Figure 2. To recap, I hypothesize that members who make identity claims with the eNoP through their third place participation (H1a), members who have greater affective place attachment to the third place portions of the network (H2a), and the greater the member’s score in the peer-to-peer feedback system (H3a), the lower the propensity of becoming inactive on the practice side of the eNoP. I further hypothesize that the usefulness of the peer-to-peer feedback system (i.e. member’s score in the peer-to-peer feedback system) will be qualified by affective third place attachment (H4a) and site level identity claims made by third place participants (H5a). Table 8 shows the results for the models used to test these hypotheses.

The first hypothesis (H1a) proposes that members making a third place identity claim reduces the hazard of becoming inactive on the practice-side of the eNoP. In Model 1, the hazard of inactivity for those members who made a third place identity claim is only about 57% of the hazard for those who did not make such an identity claim, which is evidence supporting this hypothesis. Yet, this result must be interpreted with caution, because the assumption of proportionality was violated for this variable in Model 1. Models 2 and 3 include a time interaction term in order to account for this assumption violation. Table 9 shows the hazard ratios for members who made a third place identity claim across the 275 day observation period in Models 2 and 3. At the beginning of the observation period (time equal to zero days), the hazard of inactivity for those members who made a third place identity claim is only about 77% (Model 2) or 73% (Model 3) of the hazard for those who did not make such an identity claim (keeping all other covariates constant). At the end of the observation period (time equal to 275 days), the hazard of inactivity for those who made a third place identity claim is roughly 29%
(Model 2) or 32% (Model 3) of the hazard for those who did not make such an identity claim (keeping all other covariates constant). Therefore, there is support for this hypothesis throughout the observation period even though the effect is greater at the end of the period than in the beginning of the period.

The second hypothesis (H2a) posits that the greater the affective third place attachment, the lower the propensity of becoming inactive on the practice side of the eNoP. Model 1 indicates that as a member’s affective third place attachment increases by one unit (irrespective of time), and all other variables are held constant, the hazard of becoming inactive on the practice side of the eNoP decreases by roughly 4%, which is evidence supporting this hypothesis. This effect is consistent across Models 1 through 4. This effect is not as strong as the effect of third place identity claims, but still represents a meaningful reduction in the hazard of becoming inactive on the practice side of the eNoP nonetheless. Therefore, there is support for the hypothesis that affective third place attachment reduces the propensity of becoming inactive on the practice side of the eNoP.

The third hypothesis (H3a) proposes that the greater a member’s score in the peer-to-peer feedback system, the lower the propensity of becoming inactive on the practice side of the eNoP. In Model 1, for each one unit increase (which is one standard deviation in this case) in a member’s score in the peer-to-peer feedback system (standardized scale), the hazard of inactivity decreases by 25%, which is evidence supporting this hypothesis. Yet, this result must be interpreted with caution, because the assumption of proportionality was violated for this variable in Model 1. Model 2 includes a time interaction term in order to account for this assumption violation. Table 9 shows the different hazard ratios for this variable over the 275 day observation period in Model 2. In the beginning of the observation period (time equal to zero
days), a one standard deviation increase (decrease) in a member’s score in the peer-to-peer feedback system decreases (increases) the hazard of inactivity by roughly 43% (77%), which is evidence supporting this hypothesis. The effect, however, dissipates over the 275 day observation period in Model 2 to the point where the effect becomes not significant. This may be the case because a member’s score in the peer-to-peer feedback system is not fixed (i.e. a member’s score changes continuously), but this model is testing the effect of each member’s score in the system as of 12/31/2010. Nevertheless, Models 1 and 2 show cautious support for the hypothesis that a member’s score in the peer-to-peer feedback system reduces the propensity of becoming inactive on the practice-side of the eNoP.

Table 9. Time-Dependent Hazard Ratios for Models 2, 3, & 4

<table>
<thead>
<tr>
<th>Score in P2P Feedback System</th>
<th>Time: Days Until Inactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Standard Deviation Above the Mean</td>
<td>Model 2: 0.57***</td>
</tr>
<tr>
<td>One Standard Deviation Below the Mean</td>
<td>Model 2: 1.77***</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H3a Supported</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Place Identity Claim</th>
<th>Time: Days Until Inactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member's Making a Third Place Identity Claim (1)</td>
<td>Model 2: 0.77**</td>
</tr>
<tr>
<td>Model 3: 0.73**</td>
<td>Model 3: 0.48***</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H1a Supported</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market Degree Centrality</th>
<th>Time: Days Until Inactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Market Relationship Increase</td>
<td>Model 2: 0.94***</td>
</tr>
<tr>
<td>Model 3: 0.94***</td>
<td>Model 3: 0.97***</td>
</tr>
<tr>
<td>Model 4: 0.94***</td>
<td>Model 4: 0.97***</td>
</tr>
<tr>
<td>One Market Relationship Decrease</td>
<td>Model 2: 1.07***</td>
</tr>
<tr>
<td>Model 3: 1.07***</td>
<td>Model 3: 1.03***</td>
</tr>
<tr>
<td>Model 4: 1.07***</td>
<td>Model 4: 1.03***</td>
</tr>
</tbody>
</table>

*Significant at 0.10, ** Significant at 0.05, *** Significant at 0.01

The fourth hypothesis (H4a) posits that the impact that a member’s score in the peer-to-peer feedback system has on maintaining active membership on the practice side of the eNoP will be greater for members who have greater affective place attachment to the third place portions of
the eNoP. In order to test this hypothesis given the assumption of proportionality violation, I tested a three way interaction of affective third place attachment, each member’s score in the peer-to-peer feedback system, and days until inactive. This three way interaction term was significant in Model 3, which means the impact of a member’s score in the peer-to-peer feedback system on the hazard of inactivity is qualified by affective third place attachment and a function of time. Table 10 shows the hazard ratios for this three way interaction, while keeping all other covariates constant. For those members that have an average score in the peer-to-peer feedback system, a one unit decrease (increase) in affective third place attachment increases (decreases) the hazard of inactivity by 4% (irrespective of time). For members who have a high score in the system (one standard deviation above the average), a one unit decrease (increase) in affective third place attachment increases (decreases) the hazard of inactivity by between 2 and 3% depending on the time period. For members who have a low score in the system (one standard deviation below the average), a one unit decrease (increase) in affective third place attachment increases (decreases) the hazard of inactivity by between 5 and 8% depending on the time period. In all cases, the effect of a member’s score in the peer-to-peer feedback system on the hazard of inactivity is reduced for those members that are more affectively attached to the third place portions of the eNoP, but the effect is strongest for those members who have a low score in the peer-to-peer feedback system. The model fit as determined by the AIC with covariates is better in Model 3 relative to Model 1. Therefore, there is support for the hypothesis that the impact of a member’s score in the peer-to-peer feedback system is qualified by a member’s affective third place attachment.
Table 10. Hazard Ratios for Model 3 for a Member’s Score in the P2P Feedback System and Affective Third Place Attachment

<table>
<thead>
<tr>
<th>Score in P2P Feedback System</th>
<th>One Standard Deviation Above the Mean</th>
<th>Average</th>
<th>One Standard Deviation Below the Mean</th>
<th>One Unit Increase</th>
<th>Average</th>
<th>One Unit Decrease</th>
<th>One Unit Increase</th>
<th>Average</th>
<th>One Unit Decrease</th>
<th>One Unit Increase</th>
<th>Average</th>
<th>One Unit Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME: 0 DAYS UNTIL INACTIVE</td>
<td>Affective Place Attachment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Unit Increase</td>
<td>0.68</td>
<td>0.71</td>
<td>0.74</td>
<td>0.69</td>
<td>0.71</td>
<td>0.74</td>
<td>0.69</td>
<td>0.71</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>0.96</td>
<td>1.00</td>
<td>1.04</td>
<td>0.96</td>
<td>1.00</td>
<td>1.04</td>
<td>0.96</td>
<td>1.00</td>
<td>1.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Standard Deviation Below the Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Unit Increase</td>
<td>1.35</td>
<td>1.40</td>
<td>1.46</td>
<td>1.34</td>
<td>1.40</td>
<td>1.47</td>
<td>1.34</td>
<td>1.40</td>
<td>1.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>H4a Supported</td>
<td>H4a Supported</td>
<td>H4a Supported</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fifth hypothesis (H5a) proposes that the impact that a member’s score in the peer-to-peer feedback system has on maintaining active membership will be greater for members who make identity claims with the eNoP through their third place participation. In order to test this hypothesis given the assumption of proportionality violation for both variables, I tested a three way interaction of third place identity claims, each member’s score in the peer-to-peer feedback system, and days until inactive. This three way interaction was significant in Model 4, which means the impact of a member’s score in the peer-to-peer feedback system on the hazard of inactivity is qualified by third place identity claims and a function of time (see Table 11). Although the effect is not the same across all time periods in Model 4, the impact that a member’s score in the peer-to-peer feedback system has toward reducing the hazard of becoming inactive on the practice-side of the eNoP is greater when the member makes a third place identity claim relative to those who do not make such an identity claim. The effect of making a third place identity claim is greatest for members with a below average score in the system across all
time periods relative to members with an average or an above average score in the system. The model fit as determined by the AIC with covariates is better in Model 4 relative to Model 1. Therefore, there is support for the hypothesis that the impact of a member’s score in the peer-to-peer feedback system is qualified by making a place identity claim through participation in the third place portions of the site.
Table 11. Hazard Ratios for Model 4 for a Member’s Score in the P2P Feedback System and Third Place Identity Claims

<table>
<thead>
<tr>
<th>Score in P2P Feedback System</th>
<th>TIME: 0 DAYS UNTIL INACTIVE</th>
<th>TIME: 137.5 DAYS UNTIL INACTIVE</th>
<th>TIME: 275 DAYS UNTIL INACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Place Identity Claim</td>
<td>Yes (1) No (0)</td>
<td>Yes (1) No (0)</td>
<td>Yes (1) No (0)</td>
</tr>
<tr>
<td>One Standard Deviation Above the Mean</td>
<td>0.34 0.58</td>
<td>0.45 0.58</td>
<td>0.59 0.58</td>
</tr>
<tr>
<td>Average</td>
<td>0.60 1.00</td>
<td>0.60 1.00</td>
<td>0.60 1.00</td>
</tr>
<tr>
<td>One Standard Deviation Below the Mean</td>
<td>1.04 1.74</td>
<td>0.79 1.74</td>
<td>0.61 1.74</td>
</tr>
<tr>
<td>Significance Test for Score in P2P Feedback System <em>Third Place Identity Claim</em>Time=0</td>
<td>Significant at 0.01</td>
<td>Significant at 0.01</td>
<td>Significant at 0.01</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H5a Supported</td>
<td>H5a Supported</td>
<td>H5a Supported</td>
</tr>
</tbody>
</table>

In all models, I am controlling for the variability in the hazard of inactivity associated with how central a member is on the practice side of the network. In Model 1, increasing a member’s market degree centrality by one relationship (one unit) and keeping all other variables constant, decreases the hazard of inactivity by 4%. Across Models 2 through 4, the effect of market degree centrality was strong in the beginning of the observation period, but dissipated to having no statistically significant impact at the end of the observation period.

**Positively Rated Practice-Related Contributions**

These are the hypotheses depicted in the bottom section of Figure 2. To recap, I hypothesize that members who make identity claims with the eNoP through their third place participation (H1b), members who have greater affective place attachment to the third place portions of the network (H2b), and the greater the member’s score in the peer-to-peer feedback system (H3b), the higher the propensity of contributing a positively rated practice-related contribution. I further
hypothesize that the usefulness of the peer-to-peer feedback system will be qualified by affective third place attachment (H4b) and site level identity claims made by third place participants (H5b). Table 12 shows the results for the models used to test these hypotheses.
Table 12. Models Testing Hypotheses Related to Positively Rated Practice-Related Contributions

<table>
<thead>
<tr>
<th></th>
<th><strong>MODEL 5</strong></th>
<th><strong>MODEL 6</strong></th>
<th><strong>MODEL 7</strong></th>
<th><strong>MODEL 8</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parameter Estimate</td>
<td>Hazard Ratio</td>
<td>Parameter Estimate</td>
<td>Hazard Ratio</td>
</tr>
<tr>
<td>Affective third place attachment</td>
<td>0.02*** 1.02</td>
<td>0.01*** 1.01</td>
<td>0.02*** Not Reported</td>
<td>0.02*** 1.02</td>
</tr>
<tr>
<td>Third Place Identity</td>
<td>2.25*** 9.49</td>
<td>2.54*** See Table 13</td>
<td>2.50*** See Table 13</td>
<td>2.19*** See Table 14</td>
</tr>
<tr>
<td>Score in P2P Feedback System</td>
<td>-0.10*** 0.90</td>
<td>-0.07* See Table 13</td>
<td>-0.04 Not Reported</td>
<td>-0.06 See Table 14</td>
</tr>
<tr>
<td>Market Degree Centrality</td>
<td>0.02*** 1.02</td>
<td>0.01*** See Table 13</td>
<td>0.01*** See Table 13</td>
<td>0.02*** See Table 13</td>
</tr>
<tr>
<td>(Third Place Identity)*(Days Until Positive Contribution)</td>
<td></td>
<td>-0.007*** See Table 13</td>
<td>-0.005*** See Table 13</td>
<td></td>
</tr>
<tr>
<td>(Score in P2P Feedback System)*(Days Until Positive Contribution)</td>
<td></td>
<td>0.004*** See Table 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Market Degree Centrality)*(Days Until Positive Contribution)</td>
<td></td>
<td>0.0001*** See Table 13</td>
<td>0.0001*** See Table 13</td>
<td>0.00010*** See Table 13</td>
</tr>
<tr>
<td>(Affective third place attachment)<em>(Score in P2P Feedback System)</em>(Days Until Positive Contribution)</td>
<td></td>
<td>1.2E-6 Not Reported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Third Place Identity)*(Score in P2P Feedback System) *(Days Until Positive Contribution)</td>
<td></td>
<td>0.002* See Table 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>3401</td>
<td>3401</td>
<td>3401</td>
<td>3401</td>
</tr>
<tr>
<td>Censored</td>
<td>2,929</td>
<td>2,929</td>
<td>2,929</td>
<td>2,929</td>
</tr>
<tr>
<td>AIC Without Covariates</td>
<td>7,594.67</td>
<td>7,594.67</td>
<td>7,594.67</td>
<td>7,594.67</td>
</tr>
<tr>
<td>AIC With Covariates</td>
<td>6,855.48</td>
<td>6,819.34</td>
<td>6,833.44</td>
<td>6,839.60</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>747.19 (4 df)***</td>
<td>789.32 (7 df)***</td>
<td>775.22 (7 df)***</td>
<td>767.07 (6 df)***</td>
</tr>
<tr>
<td>Score</td>
<td>4,603.03 (4 df)***</td>
<td>4,629.74 (7 df)***</td>
<td>4,635.26 (7 df)***</td>
<td>4,629.24 (6 df)***</td>
</tr>
<tr>
<td>Wald</td>
<td>1,159.27 (4 df)***</td>
<td>1,267.04 (7 df)***</td>
<td>1,236.01 (7 df)***</td>
<td>1,279.18 (6 df)***</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H1b &amp; H2b supported</td>
<td>H1b &amp; H2b supported</td>
<td>H1b &amp; H2b supported</td>
<td>H1b &amp; H2b supported</td>
</tr>
<tr>
<td></td>
<td>H3b not supported</td>
<td>H3b supported in certain time periods at the 0.1 level</td>
<td>H3b &amp; H4b not supported</td>
<td>H3b not supported &amp; H5b cautiously supported</td>
</tr>
</tbody>
</table>

*Significant at 0.10, ** Significant at 0.05, *** Significant at 0.01
The first hypothesis (H1b) proposes that members making a third place identity claim increases the hazard of contributing a positively rated practice-related contribution. In Model 5, the hazard of contributing a positively rated practice-related post is 848% greater for those members making a third place identity claim relative to those members who did not make such an identity claim (holding all other covariates constant), which is evidence supporting this hypothesis. Yet, this result must be interpreted with caution, because the assumption of proportionality was violated for this variable in Model 5. Models 6 and 7 include a time interaction term in order to account for this assumption violation. Table 13 shows the different hazard rates for members making a third place identity claim across the 275 day observation period. In Models 6 and 7, the effect of third place identity claims on the hazard of contributing a positively rated practice-related post is positive in all time periods. The effect, however, does get smaller over time, and is not significant in Model 6 at the end of the observation period (see Table 13). In Model 7, however, the effect remains significant across all time periods. Therefore, all models generally support the hypothesis that third place identity claims increase the propensity to contribute a positively rated practice-related contribution.

The second hypothesis (H2b) proposes that affective third place attachment increases the propensity of contributing a positively rated practice-oriented contribution. Model 5 indicates that as a member’s affective third place attachment increases by one unit (irrespective of time), and all other variables are held constant, the hazard of contributing a positively rated practice-related contribution increases by 2%, which is evidence supporting this hypothesis. This effect is small, but significant with roughly the same hazard rate in Models 6 through 8. Therefore, all models provide support for the hypothesis that affective third place attachment increases the propensity of contributing a positively rated practice-related contribution.
The third hypothesis (H3b) proposes that the greater a member’s score in the peer-to-peer feedback system increases the propensity of contributing a positively rated practice-related contribution. Interestingly, the effect is highly significant and negative in Model 5 and negative at the start of the observation period in Model 6 (but only significant at the 0.1 level) (See Table 13). This means that increasing a member’s score in the peer-to-peer feedback system by one standard deviation decreases the hazard of contributing a positively rated practice-related post by roughly 10% (Model 5). In essence, once a member had achieved a high score in the peer-to-peer feedback system, he/she isn’t as likely to continue contributing positively rated practice-related posts to the eNoP. The result in Model 5, however, has to be interpreted with caution because the assumption of proportionality is violated for this variable. Model 6 includes a time interaction term to account for this assumption violation. In Model 6, as a member’s score in the system increases by one standard deviation at the start of the observation period (time equal to zero days), holding all other variables constant, the hazard of contributing a positively rated practice-related contribution decreases by 7%. This effect flips in the expected direction as we get further away from 12/31/2010. At the end of the observation period in Model 6 (time equal to 275 days), a one standard deviation increase in a member’s score in the peer-to-peer feedback system, results in a 212% increase in the hazard of contributing a positively rated practice-related contribution. Therefore, there is some evidence supporting the hypothesized positive relationship between a member’s score in the peer-to-peer feedback system and the propensity of contributing positively rated practice-oriented content and some evidence suggesting the relationship is in the opposite direction.
Table 13. Time-dependent Hazard Ratios for Models 6, 7, & 8

<table>
<thead>
<tr>
<th>Time (Days Until Positively Rated Contribution)</th>
<th>0</th>
<th>137.5</th>
<th>275</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Score in P2P Feedback System</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Standard Deviation Above the Mean</td>
<td>Model 6: 0.93*</td>
<td>Model 6: 1.71***</td>
<td>Model 6: 3.12***</td>
</tr>
<tr>
<td>One Standard Deviation Below the Mean</td>
<td>Model 6: 1.07*</td>
<td>Model 6: 0.59***</td>
<td>Model 6: 0.32***</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H3b not supported</td>
<td>H3b supported</td>
<td>H3b supported</td>
</tr>
<tr>
<td><strong>Third Place Identity Claim</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member's Making a Third Place Identity Claim (1)</td>
<td>Model 6: 12.63***</td>
<td>Model 6: 4.78***</td>
<td>Model 6: 1.81</td>
</tr>
<tr>
<td></td>
<td>Model 7: 12.20***</td>
<td>Model 7: 6.25***</td>
<td>Model 7: 3.21***</td>
</tr>
<tr>
<td>Conclusion</td>
<td>H1b supported</td>
<td>H1b supported</td>
<td>H1b not supported in Model 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H1b supported in Model 7</td>
</tr>
<tr>
<td><strong>Market Degree Centrality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Market Relationship Increase</td>
<td>Model 6: 1.01***</td>
<td>Model 6: 1.03***</td>
<td>Model 6: 1.05***</td>
</tr>
<tr>
<td></td>
<td>Model 7: 1.01***</td>
<td>Model 7: 1.03***</td>
<td>Model 7: 1.05***</td>
</tr>
<tr>
<td></td>
<td>Model 8: 1.02***</td>
<td>Model 8: 1.03***</td>
<td>Model 8: 1.04***</td>
</tr>
<tr>
<td>One Market Relationship Decrease</td>
<td>Model 6: 0.99***</td>
<td>Model 6: 0.97***</td>
<td>Model 6: 0.95***</td>
</tr>
<tr>
<td></td>
<td>Model 7: 0.99***</td>
<td>Model 7: 0.97***</td>
<td>Model 7: 0.95***</td>
</tr>
<tr>
<td></td>
<td>Model 8: 0.98***</td>
<td>Model 8: 0.97***</td>
<td>Model 8: 0.96***</td>
</tr>
</tbody>
</table>

*Significant at 0.10, ** Significant at 0.05, *** Significant at 0.01

The fourth hypothesis (H4b) proposes that the impact of a member’s score in the peer-to-peer feedback system on the propensity of contributing a positively rated practice-related contribution is qualified by how affective attached a member is to the third place portions of the site. Given the proportionality assumption violation, this effect was tested using a three way interaction between time, each member’s score in the peer-to-peer feedback system, and affective third place attachment. This three way interaction is not significant in Model 7. Including this factor in the model also results in the main effect of a member’s score in the peer-to-peer feedback system dropping out of significance. Therefore, this hypothesis is not supported in these data and the hazard ratios are not reported due to the lack of significant results.

The fifth hypothesis (H5b) proposes that the impact of a member’s score in the peer-to-peer feedback system on the propensity of contributing a positively rated practice-related contribution...
is qualified by third place identity claims. Given the proportionality assumption violation, this effect was tested using a three way interaction between time, each member’s score in the peer-to-peer feedback system, and third place identity claims. In Model 8, this three way interaction is significant and meaningful, but including the three way interaction term in the model causes the main effect of a member’s score in the peer-to-peer feedback system to drop out of significance. Table 14 shows the hazard ratios for this three way interaction in Model 8. Interestingly and consistent with this hypothesis, the hazard ratios for those members making a third place identity claim relative to those who do not make such an identity claim are significantly greater for all member’s scores in the peer-to-peer feedback system across all time periods. Without making a third place identity claim, a one standard deviation increase in a member’s score in the feedback system decreases the hazard of contributing a positively rated practice-related post by roughly 6% (across all time periods in the model). For those members making a third place identity claim, a one standard deviation increase in a member’s score in the feedback system increases the hazard of contributing a positively rated practice-related contribution by between 734% and 1300% (depending on the time period). The effect is strongest across all time periods for those members with a high score in the system (but strong for members with low scores as well). The model fit as determined by the AIC with covariates is better in Model 8 relative to Model 5. Therefore, there is some support for this hypothesis, but including the interaction term in the model causes the main effect of a member’s score in the peer-to-peer feedback system to drop out of significance.
Table 14. Hazard Ratios for Model 8 for a Member’s Score in the P2P Feedback System and Third Place Identity

<table>
<thead>
<tr>
<th>Score in P2P Feedback System</th>
<th>TIME: 0 DAYS UNTIL INACTIVE</th>
<th>TIME: 137.5 DAYS UNTIL INACTIVE</th>
<th>TIME: 275 DAYS UNTIL INACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Third Place Identity Claim</td>
<td>Third Place Identity Claim</td>
<td>Third Place Identity Claim</td>
</tr>
<tr>
<td></td>
<td>Yes (1)</td>
<td>No (0)</td>
<td>Yes (1)</td>
</tr>
<tr>
<td>One Standard Deviation Above the Mean</td>
<td>8.34</td>
<td>0.94</td>
<td>10.82</td>
</tr>
<tr>
<td>Average</td>
<td>8.89</td>
<td>1.00</td>
<td>8.89</td>
</tr>
<tr>
<td>One Standard Deviation Below the Mean</td>
<td>9.48</td>
<td>1.07</td>
<td>7.31</td>
</tr>
</tbody>
</table>

Significance Test for Score in P2P Feedback System*Third Place Identity Claim*Time=0

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>H5b supported</th>
<th>H5b supported</th>
<th>H5b supported</th>
</tr>
</thead>
</table>

Note: Main effect of a Member’s Score in P2P Feedback System is not significant in Model 8

In all models, I am controlling for the variability in the hazard of contributing a positively rated practice-related contribution associated with how central a member is on the practice side of the network. The effect of increasing a market relationship by a single relationship increases the hazard of contributing a positively rated practice-oriented post by between 1% and 5% depending on the days from 12/31/2010 in Models 6 through 8.

Summary

To summarize the quantitative results, there is significant evidence supporting the main effect hypotheses related to affective third place attachment and third place identity claims reducing the propensity of becoming inactive on the practice side of the eNoP (H1a & H2a supported) and increasing the propensity of contributing a positively rated practice-related contribution (H1b & H2b supported). The impact that a member’s score in the peer-to-peer feedback system has on both outcome variables is mixed. On the one hand, the higher a
member’s score in the system reduces the propensity of becoming inactive on the practice side of the eNoP, but this effect drops out of significance over time, possibly due to the way I am measuring each member’s score and the way that I am modeling the effect (H3a cautiously supported). On the other hand, however, there is mixed evidence in terms of the impact that a member’s score in the peer-to-peer feedback system has on the propensity of contributing a positively rated practice-related contribution. Some models indicate that the relationship may be negative (but not significant) while other models indicate that the relationship is positive and significant (H3b not supported).

There is also evidence supporting some of the qualifying hypotheses. Related to the propensity of becoming inactive on the practice side of the eNoP, the impact of a member’s score in the peer-to-peer feedback system is greater for those members more affectively attached to the third place portions of the eNoP across all observed time periods (H4a supported), and the effect is greater for those members with a below average score in the peer-to-peer feedback system across all observed time periods. Affective third place attachment did not, however, have an impact on the usefulness of a member’s score in the peer-to-peer feedback system on increasing the propensity of contributing a positively rated practice-related contribution (H4b not supported).

The impact that a member’s score in the peer-to-peer feedback system has on reducing the hazard of becoming inactive on the practice-side of the eNoP is greater when a member makes a third place identity claim relative to those who do not make such an identity claim (H5a supported). Additionally, the effect of making a third place identity claim on reducing the hazard of becoming inactive on the practice-side of the eNoP is greatest for members with a below average score in the system across all time periods relative to members with an average
and above average score in the system. There is some evidence that the impact that a member’s score in the peer-to-peer system has toward increasing the hazard of contributing a positively rated practice-related contribution is qualified by third place identity claims, but the main effect of a member’s score in the peer-to-peer feedback system drops out of significance when the interaction term is included (H5b weak support). Notwithstanding the one term dropping out of significance, the effect of a member’s score in the peer-to-peer feedback system toward the propensity of contributing a positively rated practice-related contribution is strongest across all time periods for those members with a high score in the system (but strong for members with low scores as well).

**Discussion & Conclusions**

Previous eNoP literature and literature on professional knowledge networks have viewed off-topic discussions as noise, distracting participants from the utilitarian aspects (i.e. learning and the sharing of domain-specific knowledge) of these sites (Phang, et al., 2009; Preece, 2000; Preece & Schneiderman, 2009). Yet, off-topic social interactions such as sharing pictures, discussing personal matters, or having impromptu discussions on current affairs or sporting events may be important mechanisms through which members may derive social value from participation (Ren, et al., 2007; Ridings & Wasko, 2010). The results from my study further support the importance of off-topic social interactions to the long term engagement of members on the practice-side of the eNoP by providing qualitative and quantitative evidence concerning the importance of third place style mechanisms. In my study, I first demonstrated that the off-topic forum at TPC exhibits many of the dimensions of third places as defined by Oldenburg (1989). I then demonstrated that affective third place attachment and third place identity claims positively impact participation on the practice side of the eNoP.
**Theoretical Contributions**

My study makes several theoretical contributions. First, I contribute to existing studies explaining the flow of knowledge, information and advice in eNoP and other electronic social structures. Existing literature has investigated individual intrinsic motivators such as altruism and general enjoyment (Constant, et al., 1996; Sproull, et al., 2005), individual extrinsic motivators such as status and reputation (Lampel & Bhalla, 2007; Lerner & Tirole, 2002), community level motivators such as commitment and reciprocity (Bateman, et al., 2006; Blanchard & Markus, 2004; Cummings, et al., 2002; Ren, et al., 2007; Ren, et al., 2012), and structural factors such as network centrality and social capital (Chiu, et al., 2006; McLure Wasko & Faraj, 2005) in order to explain and predict the flow and quality of user contributions.

The results from my study indicate that place attachment and place identity claims (specifically in relation to the third place portions of the eNoP) are important factors to consider when investigating why members contribute to and remain active in these electronic social structures. The importance of place attachment specifically extends previous research that theorized attachment to groups and communities are important factors explaining contribution intentions and behaviors (Ren, et al., 2012). I made the case in this study that place attachment is a similar yet distinct concept. Similarly, issues of identity and identity claims in relation to the community or to the practice have been found to be important factors governing the social dynamics within eNoP and related communities of practice (CoP) (Ma & Agarwal, 2007; Wenger, 1998). However, issues related to place identity have not received much attention in this line of research. If an individual defines a portion of his/her online identity in relation to a virtual place, then it is my conjecture that he/she may have a higher propensity to contribute to
the eNoP. Results from my study provide some evidence supporting this conjecture, particularly related to third place participation and resulting identity claims.

Second, my research illustrates that eNoP that are similar to TPC may no longer be just places for knowledge sharing. Many of these sites have been existence for a decade or more and represent rich social structures that extend beyond the simple sharing of domain-specific knowledge, information and advice. In this manner, these eNoP represent social systems instead of merely resource exchange systems (Kraut, et al., 2010). My study indicates that many members participate in these eNoP to satisfy their needs for sociability or the play-form of association (Simmel, 1908/1971), and, as a result, these sites have become significant places in many member’s lives. Furthermore, when individuals associate a place as a significant place in their lives, those individuals tend to form an intense loyalty to that place (Belk, 1992; Rosenbaum, 2006; Sherry, 1998). My study highlights how social activities that, on the surface, seem to be distractions from the practice-related activities are not distractions if these types of activities create a symbolically constructed virtual third place within an eNoP. A major function of third places is to bring the community closer together by creating a collectivist norm, which spills over to activities and interactions happening outside of the third place (Oldenburg, 1989).

Third, this study contributes to Roberts et al. (2006) who argue that motivators to contribute content interact in complex ways. Previous research theorizes that members are motivated to achieve as high a status in these communities as possible (Lampel & Bhalla, 2007; Lerner & Tirole, 2002), and one common measure of status in these communities is the number of votes a member has received or a member’s score in the peer-to-peer feedback systems. Furthermore, there is a high switching cost associated with abandoning a site where a member has invested a lot of time and energy to ‘earn’ those votes. My study provides empirical evidence that supports
this claim (primarily in relation to the membership inactivity outcome variable), but I also demonstrate empirically that the impact of a member’s score in the peer-to-peer feedback system is qualified by affective third place attachment and third place identity claims. I argue that this is the case because attaining and maintaining a high status in ‘just another’ knowledge sharing site will be less important than attaining and maintaining a high status in a place of emotional and psychological significance.

Fourth, especially in the software development industry, many eNoP have focused on relatively routine problems of practice (i.e. sub routine is in an infinite loop, variable definition issues, runtime errors, syntax problems, program structure, and so on). Literature in knowledge management has suggested that more complex, tacit knowledge requires a strong tie to share such knowledge (Hansen, 1999), but the weak ties associated with eNoP may not be conducive to solving such complex, tacit problems. However, the third place portions of the site might strengthen the ties between the professional practitioners, which may enable these eNoP to start solving more complicated practice-related problems. A portion of the CoP literature argues that CoP may be used for strategically important tasks and not just routine tasks (Anand, et al., 2007) due, in part, to the trust that develops between participants in tightly knit CoP. I argue that third place participation has the potential to develop this trust between members (Oldenburg, 1989), which may enable the discussion of more complicated problems on the practice side of the eNoP. In this manner, concepts of place may be able to bridge the theoretical gap between the CoP and NoP literature.

**Practical Implications**

Meaningful social interactions and creating a sense of place may give members a reason to return to the eNoP, which may help these eNoP achieve and retain a critical mass of members.
and ultimately succeed. Schultz and Boland (2000b) demonstrate that knowledge workers are constantly looking for places to conduct and engage in meaningful activities and many eNoP are comprised of such knowledge workers. Saunders et al. (2011) also propose that virtual users who have a heightened sense of place will get more enjoyment out of participating in the virtual world. Results from my study suggest that an effective means to promote membership longevity and high-quality posts is to encourage members to participate in the sociability portions of the network such that the eNoP may become more like a virtual third place instead of ‘just another’ knowledge sharing forum. Results from my study also indicate that third place participation increases the impact that member’s scores within peer-to-peer feedback systems has on promoting future practice-related contributions. Therefore, eNoP administrators and owners may want to market these professional knowledge sharing sites as broad social systems which contain rich knowledge sharing forums and virtual third place style forums in order to encourage long-term engagement.

Not all off-topic forums constitute virtual third places. Third places have distinct characteristics such as a playful mood, regular participants, accessibility and accommodation and a home away from home. As such, simply implementing an off-topic forum within an eNoP may not achieve the desired effects on the practice-side of the eNoP. Off-topic forums have the possibility of degrading into the lowest common denominator of Internet forums (name calling, posting inappropriate content, flaming, and so on) and this may be detrimental to the eNoP. Site administrators have to find a balance between excessively moderating these forums and letting these forums turn into a free for all. That balance may be the difference between creating an environment that facilitates the formation of a virtual third place or creating a 4chan type of environment that may drive members away from not only the off-topic forums but also the eNoP.
This study also has implications for managers. In the current business environment, employees are spending more and more time interacting with virtual colleagues instead of interacting with people in face-to-face situations. As such, employees have the potential problems of isolationism and loneliness resulting from distributed work environments and the lack of real interpersonal social support associated with these organizational climates and forms (Lai & Burchell, 2008; Litwin & Stringer, 1968; Marshall, Michaels, & Mulki, 2007). There are many escapes in the virtual world such as Facebook, Pinterest, or Twitter, but these escapes are generally purely social in nature, whereby there is minimal chance that an employee is going to perfect his/her craft by spending time on these sites. As such, as a general rule managers don’t want their employees spending their downtime ‘Facebooking.’ eNoP, however, are different from these other types of social networks, because they offer the opportunity to combine learning, professional networking and general sociability in order to potentially combat workplace loneliness in a more productive manner. Thus, encouraging employees to become affectively attached to a professional eNoP through their third place forums may foster positive emotional feelings, which have been positively linked with job performance and job satisfaction (Wiesenfeld, Raghuram, & Garud, 2001; Yilmaz, 2008).

Limitations and Future Research

Much of the empirical research on place attachment and place identity claims use surveys where researchers directly ask subjects questions concerning how meaningful a particular place is to them (Giuliani, 2003). My study, however, used archival data and proxy measures for these two constructs. These proxies may have some construct overlap with related constructs such as attachment to the community or the group or identity claims in relation to the community or the group. A future study may utilize a survey based approach using existing scales in order to
assess the fidelity of these proxies and in order to gain further insights into the impact that place, third places, third place identity claims and affective third place attachment have on practice-related contributions.

I measured my variables at a single point in time (i.e. affective third place attachment and third place identity claims calculated as of 12/31/2010) and I investigated the impact of these variables on both outcome variables starting on 12/31/2010 23:59 for the first 275 days of calendar year 2011, but the impact of third place participation may depend on the stage of development of the eNoP or the virtual third place. For example, is the effect of third place attachment and participation greater when the eNoP or the virtual third place within the eNoP is emerging relative to when the eNoP or the virtual third place within the eNoP is more mature or in decline? My study involved a relatively mature eNoP and mature virtual third place (at the time I conducted my study). Testing the impact of third place participation in 2001 on practice-related contributions in 2001 might reveal a different set of relationships or a different pattern of estimators. McCarthy and colleagues (2009) demonstrate that their subjects had more place attachment over time in their investigation of a place-based social networking application within a third place. An interesting future study would be to investigate the impact of third place ties, affective attachment and place identity have on practice-related activities throughout the life cycle of the eNoP and the life cycle of the virtual third place.

More research in different contexts is needed in order to evaluate the generalizability of my findings. Programmers represent an interesting and somewhat unique occupational culture. Based on the nature of their discipline, programmers spend most of their workdays online so it is possible that the virtual third place dynamics within a programming eNoP may be different than in an eNoP of Doctors or Lawyers where the practitioners may not be as comfortable interacting
in virtual environments. As such, a context extension investigating third places within an eNoP in a different occupational culture would be an important and interesting study. Additionally, investigating issues of place and third place dynamics outside of the eNoP space would be important. For example, would we see similar dynamics in non eNoP such as Wikipedia, Digg, or Reddit? Nevertheless, the results from this study provide empirical evidence that those members who are more affectively attached to the third place aspects of the site and have made identity claims from their third place participation have higher propensities to remain active within the practice side of the site and also have higher propensities to contribute higher quality content.

My results concerning the interaction of each place variable and each member’s score in the peer-to-peer feedback system are stronger for the membership longevity outcome variable than for the positively rated practice-related posts outcome variable. This may be the case, because votes in the peer-to-peer feedback system may not be the best indicator of contribution quality. Some insightful posts may not be rewarded with positive votes in these systems. Prior literature has demonstrated that peer-to-peer feedback systems may be used as platforms for status contests (Roberts, et al., 2006; D. Stewart, 2005) and ideological competitions (Barnett, et al., 2010), suggesting that voting behaviors in these systems may be dependent on socialization within the eNoP and may be independent of contribution quality (Resnick, et al., 2000). A future study may use a different measure of contribution quality to further empirically test my hypotheses related to contribution quality and the usefulness of the feedback system.

In contrast to Oldenburg’s (1989) idealized third places, the TPC café does not appear to be completely status neutral or a completely open environment. The TPC café has a defined social hierarchy with in-groups and out-groups and individuals who have a higher status in the eNoP
than others. In real (as in non-virtual) life societies, citizens are often stratified into classes based on economic capital whereby those citizens who have economic resources are granted certain societal privileges not granted to poorer citizens. In electronic social structures such as eNoP, however, members are typically not stratified based on economic capital but based on other symbolic resources. One such symbolic resource is votes within the peer-to-peer feedback system. eNoP members may be treated differently based on the number of votes that he/she has within the system. Oldenburg’s (1989) idealized third places are not consistent with this differential treatment. The second study in this dissertation investigates social stratification particularly related to votes and voting behaviors in peer-to-peer feedback systems in more detail.
CHAPTER 3. A Cultural Sociology Perspective on Voting Practices in Peer-to-Peer Feedback Systems in Electronic Networks of Practice

Abstract

In this study, I argue that peer-to-peer feedback systems serve to socially stratify the membership into different social classes based on a variety of dimensions. I utilize a cultural sociology perspective drawing primarily from Bourdieu’s integrated social theory (fields, forms of capital and habitus) and Eliasoph and Lichterman’s concept of culture in interaction in order to explain voting practices within peer-to-peer feedback systems. Within this theoretical framework, I argue that a vote is a complex social and cultural phenomenon that is based on more than the quality of the post. In an in-depth study of the voting practices within the peer-to-peer feedback system at a large electronic network of practice (eNoP) of software developers, I demonstrate empirically that the lower the social class of the giver and receiver of feedback, the greater the differences in professional habitus between the giver and the receiver of feedback, and members who violate the group style have a higher propensity of receiving negative votes (as opposed to positive votes). My results further reveal that the effect of small professional habitus differences is amplified in the presence of a group style violation, specifically group bond violations.
Introduction

Peer-to-peer feedback systems have been implemented in all different kinds of websites from electronic commerce sites such as eBay and Amazon to user-generated content sites such as Reddit and Digg. The general purpose of these systems is to provide actionable positive and negative information to information consumers in environments where significant uncertainty and information asymmetries often exist (Adler, Alfaro, Kulshreshtha, & Pye, 2011; Josang, Ismail, & Boyd, 2007). However, despite the widespread adoption of these systems and the importance of these systems in terms of maximizing community performance and facilitating exchanges (Lampel & Bhalla, 2007; Preece & Schneiderman, 2009), there is a lack of empirical studies and theoretical frameworks in the literature explaining how these systems are actually being used in practice.

Within online discussion forums in practice-oriented virtual environments (eNoP), why posts get voted either positively or negatively can appear to be irrational and arbitrary. For example, consider the following exchange:

Member 1: Posts a discussion topic or a question
Member 2: Posts a well-articulated and insightful response
Member 3: Posts a simple ‘I agree’ with nothing new

In this exchange, Member 2 may receive a combination of positive and negative votes for his/her well-articulated and insightful contribution, while Member 3 may receive only positive votes and no negative votes for his/her rather bland contribution. This is a puzzling appropriation of these peer-to-peer feedback systems that is quite common in these types of discussion threads.

Much of the literature on peer-to-peer feedback systems is focused on explaining the impact that they have on promoting certain outcomes such as price premiums and trust in electronic commerce environments (Ba & Pavlou, 2002; Pavlou & Dimoka, 2006) and effort to contribute
content in user-generated content sites (Chen, Xu, & Whinston, 2011), but much less literature is
dedicated to the actual voting practices within these systems (Barnett, et al., 2010; Roberts, et al.,
2006; D. Stewart, 2005). Of the few studies that have empirically investigated how these
systems are being used in practice, several demonstrate that these systems may be used as
platforms for status contests (Roberts, et al., 2006; D. Stewart, 2005) and ideological
competitions (Barnett, et al., 2010), suggesting that positive and negative voting behaviors may
be dependent on socialization and may be independent of contribution quality (Resnick, et al.,
2000).

One of the reasons why eNoP and other electronic social structures have implemented peer-
to-peer feedback systems is to determine contribution quality such that the membership gets
socially stratified along dimensions of quality (Crowston, et al., 2012; Kollock & Smith, 1999;
Preece & Schneiderman, 2009). However, there is a lack of empirical research investigating
whether this type of usage is actually happening. More empirical research and a richer
theoretical understanding are needed in order to determine if these systems are fostering usage
behaviors which are socially stratifying the participants along productive dimensions such as
contribution quality or potentially unproductive dimensions such as ideology or socialized
dispositions. The purpose of this study is to investigate voting practices and why a post receives
either a positive or a negative vote. I am specifically investigating voting practices in peer-to-
peers feedback systems where the voting is binary (either positive or negative), but the proposed
research model would certainly apply to voting done on a continuous scale (i.e. likelihood that a
vote would be closer to the top (positive) or bottom (negative) end of a continuous scale).\textsuperscript{11}

\textsuperscript{11} There are many different types of peer-to-peer feedback systems. For example, some sites only allow positive
votes and others enable voting on a continuous scale, say from zero to five.
To investigate voting practices, I develop a model theoretically from a cultural sociology perspective utilizing Bourdieu’s integrated social theory and Eliasoph and Lichterman’s (2003) conceptualization of culture in interaction. I argue that a vote is a complex social and cultural phenomenon that is based on much more than simply the quality of the post. I propose that peer-to-peer feedback systems represent public platforms to legitimize those members with high scores serving to reproduce the existing social hierarchy and to delegitimize those members with low scores by symbolically disenfranchising those members who have been labeled by the system as socially inferior. Consequently, I argue the stratification of the membership into different social classes is often not purely a signal of membership or contribution quality in as much as it is a signal of mastery over the game (Bourdieu, 1998), which may lead to some degree of inequality in terms of the accumulation of votes. In this manner, social action may be governed by dispositions reinforced or challenged through the immersion of members in competitive social games (Bourdieu & Wacquant, 1992) that take place in peer-to-peer feedback systems.

In an in-depth investigation of the voting practices at a large electronic network of practice (eNoP) of software developers, I demonstrate empirically using a series of hierarchical linear models that a portion of the variability in the propensity to receive positive and negative votes may be explained by examining the post in relation to the group style of the discussion forum, the structural positioning (social class) of the receiver of feedback (author of the post), the structural positioning (social class) of the giver of feedback (voter), and the habitus differences (socialized dispositions related to the practice) between the giver and receiver of feedback. My results also indicate that the effect of small professional habitus differences between the giver and the receiver of feedback is amplified in the presence of a group style violation, specifically
group bond violations. These relationships remain statistically significant even after including a robust set of control variables such as the quality of the post and previous interaction histories between dyadic pairs of members.

This study makes several contributions to the literature. First, Bourdieu’s integrated social theory offers explanations that includes multiple dimensions, multiple levels of analysis and concepts of relationships between positions in a field (Bourdieu & Wacquant, 1992; Emirbayer & Johnson, 2008). Understanding voting practices through a cultural sociology theoretical lens (specifically Bourdieu and Eliasoph and Lichterman) enables researchers to conceptualize how voting practices relate to broader community and field dynamics. Second, my study contributes to the literature on social stratification in electronic social structures more generally. Early research on virtual communities, virtual teams and virtual groups demonstrated that, despite having minimal social and informational cues, electronic environments were still socially stratified (Ahuja & Carley, 1998; Crowston & Kammerer, 1998; Weisband, Schneider, & Connolly, 1995). Now, informational cues have been enhanced with the implementation of rich score keeping mechanisms (peer-to-peer feedback systems) that are publically visible to all members and guests, but the effect that these mechanisms have on the social dynamics and the (re)production of the social order are still not well understood. My study demonstrates empirically that peer-to-peer feedback systems can promote voting behaviors that are socially stratifying the membership on a variety of social and cultural dimensions. Third, this research contributes generally to the literature on culture in information systems research, by offering a different perspective on culture. The information systems literature generally defines culture in terms of values (Leidner & Kayworth, 2006), whereas my study defines culture in terms of processes of meaning-making and durable practices.
The theoretical perspective developed in this study has practical ramifications for designing more effective peer-to-peer feedback systems. In order to enhance the design of existing systems, it is important to first understand how the use of these systems can impact the social dynamics, interaction patterns, and social hierarchies within these sites. If, for example, these systems are fostering usage behaviors which are socially stratifying the participants along unproductive dimensions such as ideology or socialized dispositions, then it might make sense to (re)design them in such a manner that minimizes that type of stratification. This is consistent with the idea that moderated feedback systems may be superior to un-moderated feedback systems in terms of the expected performance of the overall community (Chen, et al., 2011), and the idea that institutional mechanisms such as peer-to-peer feedback systems might be more effective in fostering long-term community growth if these systems incorporate social, contextual factors into their design (Wang & Chiang, 2009).

The remainder of the chapter is organized as follows. First, I review relevant and selected literature on cultural sociology, Bourdieu’s integrated social theory and culture in interaction. Second, I develop a research model from a cultural sociology perspective in order to explain the propensity to give and/or receive positive and negative votes. Third, I discuss the research design and methods used in this study. Fourth, I present the quantitative results. Finally, I conclude with a discussion of the practical and theoretical implications of my research along with potential areas for future research.

**Literature Review**

This section lays out the foundation for the terminology and theoretical perspective used in the analysis. I first define what is meant by a cultural sociology perspective and why it is related to a study of peer-to-peer feedback systems. I then discuss Bourdieu’s integrated social theory
(fields, forms of capital and habitus) and how it relates to voting practices. I finally discuss how Eliasoph and Lichterman’s concept of culture in interaction helps explain micro-level emic differences in interactions that may not be explained in Bourdieu’s integrated social theory.

**Cultural Sociology Perspective**

Culture is an abstract concept that is difficult to define. One commonly accepted definition of culture used in the information systems literature is “the collective programming of the mind that distinguishes one group or category of people from another” (Hofstede & Bond, 1988, p. 6). The programming metaphor is slightly misleading, because programming often implies the application of universal algorithms across technological devices, which is not the case with culture as there is significant cultural variability both within and between cultures (Srite & Karahanna, 2006). Hofstede and Bond (1988), however, are using the metaphor to refer to different groups of people being programmed via social, political, economic and educational means to process information differently and, consequently, make sense of the world differently.

In another well cited definition, Kroeber and Kluckhohn (1952, p. 181) define culture in this manner:

> Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other hand as conditioning elements of further action.

Embedded in this definition of culture is the idea that values are the essence around which societies and cultures are formed (Hofstede & Hofstede, 2005; Leidner & Kayworth, 2006).

Different components of culture include shared values, beliefs, motives, norms, symbols, myths, and rituals (House, Hanges, Javidan, Dorfman, & Gupta, 2004; Schein, 2010; Smith & Riley, 2009). Although most scholars do not agree on what components or dimensions constitute
culture, the common element in most analytical frameworks tends to be shared values (Schein, 2010; Triandis, 1972). This is especially the case in frameworks utilized in information systems research (Leidner & Kayworth, 2006). Values are enduring beliefs concerning what is right versus wrong, acceptable versus unacceptable, good versus evil, and so on (Rokeach, 1973). These values serve as broad behavioral guidelines governing individual behaviors in all situations (Rokeach, 1973), and the core of culture are formed by values (Hofstede & Bond, 1988; House, et al., 2004; Triandis, 1972). In this conceptualization of culture, values provide the link between culture and action (Swidler, 1986). Leidner and Kayworth (2006) propose a framework for studying culture in the information systems discipline focusing on the interaction of values at the national, organizational and IT artifact levels. Differences between the values at each one of these levels are expected to impact how technologies are used in a given situation (Leidner & Kayworth, 2006).

A cultural sociology perspective, however, shifts the focus away from defining culture as a set of values to, instead, defining culture as *processes of meaning-making* (Griswold, 2008; Lamont, 2000; Spillman, 2002). Cultural sociologists investigate how and why meaning-making happens in addition to investigating the impact that meaning-making has on individual actions (Lamont, 2000; Smith & Riley, 2009; Spillman, 2002). From a cultural sociology perspective, culture may be conceptualized as meaning-making in everyday action, the institutional production of meaning, and the shared mental frameworks constituting the tools of meaning-making (Spillman, 2002). Eliasoph (1997), for example, argues that defining the culture of political avoidance in terms of democratic values embedded in the United States is problematic, because most United States citizens probably share the same core set of democratic values. Instead, she argues that the culture of political avoidance is a process of everyday meaning-
making where citizens within a culture may have significant variability, despite similar sets of
democratic values (Eliasoph, 1997).

Within the culture as meaning-making research program, there is the idea that culture is
enacted in everyday practices (Spillman, 2002). Swidler (1986, p. 273), for instance, states that
“culture influences action not by providing the ultimate values toward which action is oriented,
but by shaping a repertoire or ‘tool kit’ of habits, skills, and styles from which people construct
‘strategies of action.’” Using an example of the culture of poverty where individuals in poverty
generally have the same values as wealthy individuals, Swidler (1986) argues that individuals in
poverty have a different cultural tool kit at their disposal leading to different understandings
concerning the plight of the poor than wealthy individuals develop. She contends that this
conceptualization of culture offers more explanatory power to explain variation between
different societal classes within the same culture (Swidler, 1986).

Bourdieu is a prominent theorist in this particular stream of research (culture as enacted
practices). Bourdieu’s general social theory explains the process of meaning-making through
enduring practices, which are enacted through the interaction of habitus, forms of capital and
fields (Bourdieu & Wacquant, 1992). Kapferer (1987, p. ix), more specifically, states that “the
trend is toward the cultural as constitutive, not in the form of ‘value orientations’ or guides or
‘models’ for action, but as finely ingrained in what Bourdieu calls habitus, or habituated
practices of human beings.” Habitus is an individually operationalized set of understandings
acquired through socialization processes, where individuals who share a common class within a
society tend to acquire similar habitus (Bourdieu, 1993a; Bourdieu & Wacquant, 1992). Values
are often viewed as more stable than practices (Hofstede & Hofstede, 2005), so defining culture
in terms of practices might be problematic given the inherent stability associated with cultures.
However, Bourdieu argues that practices within a culture are stable, because an individual’s habitus is highly durable leading to the reproduction of practices over time (Bourdieu & Wacquant, 1992).

This perspective is useful for studying interaction patterns in peer-to-peer feedback systems particularly in eNoP for three main reasons. First, based on the types of practices that are being rewarded and punished within these systems, a culture may emerge with a well-defined social hierarchy and group style, which gets produced and reproduced through usage patterns within these systems. Second, an eNoP may be considered a type of occupational culture (Trice, 1993). Conceptualizing culture in terms of differences in meaning-making processes at the occupation level might offer a fresh perspective that the traditional culture as values literature has not considered. In the occupational culture of software developers, for instance, members share common values in terms of general programming principles but vary quite significantly in terms of their problem solving processes (processes of meaning-making). Different software developers may share similar value systems in terms of defining good software as, for example, defect free, easy to use, and useful, but the meaning-making processes in terms of how to write software that is defect free, easy to use and useful varies significantly between different development groups (Raymond, 1999).

Third, Arrigara and Levina (2008) have argued that user-generated content (UGC) sites such as Youtube, Flickr and Reddit are online cultural fields (drawn from Bourdieu), because the members of these sites share a common cultural affinity such as music, sports, politics, technology, current events and so on. Each participant within these online cultural fields may have an impact over the trajectory and social status of other individuals in that field by voting or providing feedback on the digital content provided by other members (Arrigara & Levina, 2008).
By combining broad readings of Bourdieu’s integrated social theory (forms of capital, fields and habitus) into the explanation of voting practices within eNoP, scholars may utilize a theoretical explanation that incorporates structures inscribed in the collective history of the virtual interactions, the individual history of the members, and the objective structures of the field (Bourdieu, Wacquant, & Farage, 1994).

Bourdieu defined fields, habitus and forms of capital as an integrated social theory. Habitus, fields and forms of capital are three concepts that are interrelated and investigating one concept without also investigating the others is problematic as the definitions of each concept are defined in relation to the other two (Bourdieu & Wacquant, 1992; DiMaggio, 1979; DiMaggio & Powell, 1991; Emirbayer & Johnson, 2008). Bourdieu’s concept of relationships is reified as sets of objective positions that individual’s occupy within a field, which externally constrain perceptions and practices (Bourdieu & Wacquant, 1992). The objective positions within a field also mold the mental schemata deposited inside individuals occupying those positions, thereby allowing individuals to actively construct and interpret field dynamics (Bourdieu & Wacquant, 1992; Emirbayer & Johnson, 2008). Figure 3 illustrates the relationships between the three concepts, which are explained in detail in the next three sections.
Figure 3. Relationship between Bourdieu's Theoretical Concepts

**Fields**

According to Bourdieu, a field is a macro-level, structured social space consisting of “a set of objective, historical relations between positions anchored in certain forms of power (or capital)” (Bourdieu & Wacquant, 1992, p. 16). Fields also represent “arenas of production, circulation, and appropriation of goods, services, knowledge or status, and the competitive positions held by actors in their struggle to accumulate and monopolize these different kinds of capital” (Swartz, 1997, p. 117). In this manner, fields represent configurations of social roles, social positions, and the underlying structures within which those roles and positions operate (Bourdieu, 1977b). Furthermore, participants in a field are expected to adopt strategies that correspond to the position and/or role which he/she occupies (Bourdieu, et al., 1994). For example, in the field of
academia there are many different positions such as professors, assistant professors, department chairs, lecturers, undergraduate students, graduate students, and so on. Certain positions in the field come with certain symbolic authority over others. For instance, an undergraduate student has relatively little symbolic authority over any other position within the field of academia, but a professor comes with a high degree of symbolic authority over many other positions. Yet, not all professors are valued equally in all colleges within a university (underlying structure in which positions operate). In certain business schools, for instance, a marketing professor may have a high degree of symbolic authority over, say, an MIS professor based on what that particular business school values. In this case, Bourdieu would argue that the MIS professor would engage in practices in order to change this social dynamic (change the rules of the game), possibly by lobbying the dean or other school administrators to modify the list of acceptable journals used in the promotion and tenure process. Bourdieu argues that attempts to change the rules rarely work because those in positions of power create the rules and have no real incentive to change the rules that helped put them in powerful positions, which lead to the reproduction of the social order in these settings (Bourdieu, 1977a).

A field may also be conceptualized as a relationship between positions and position-takings (Bourdieu, 1977b). In this manner, Bourdieu (1993b) argues that fields are spaces of strategic possibilities in which not all actions are equally possible or impossible. The strategic possibilities are governed by not only structural constraints of positions and accumulated histories of position-takings, but also by the values that circulate in any field (Bourdieu, 1990b). The values that circulate in a field help determine which positions are viewed as legitimate, more desirable, or of higher social status than others (Bourdieu, 1993b; Bourdieu & Wacquant, 1992). The position-taking process depends on the values inherent in the field, because those values
help shape beliefs concerning what constitutes competent behavior in a given situation (Berger, Fisek, Norman, & Zelditch Jr., 1977; Bourdieu, 1993b; Ridgeway & Berger, 1986). Within the software development occupational culture, for instance, fields subscribing to the values and meaning-making processes associated with Bill Gate’s (in)famous letter to hobbyists12 (Gates, 1976) are probably different than fields subscribing to values and meaning-making processes associated with, say, the hacker code of ethics13 (Levy, 1984). Consequently, how competitive and cooperative practices are evaluated in those two fields is expected to be different.

In order for a field to function as a field, there must be stakes and interests (how and what is to be gained or lost) along with individuals prepared to “play the game” (willing to enter the field) (Bourdieu & Wacquant, 1992). The interests and stakes that field members are contesting are linked to the fundamental existence of a field as well as the rules of the game. This means that the occupants of a field generally agree on what it is that they are playing for, but are contesting the rules of the game or the manner in which the game is played. The rules of the game may be formal such as regulatory rules or informal such as shared values or beliefs (Bourdieu, 1993a; Bourdieu & Wacquant, 1992). Fields are social spaces embroiled with conflict and competition whereby certain positions or participants are able to impose their rules of the game onto other positions or participants (Scott, 2008). Based on the rules of the game, certain practices may be viewed as legitimate while others may not, possibly leading to the exclusion of certain individuals or groups (Bourdieu, 1993b). Typically, the dominant and

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12 This is the letter that Bill Gates sent out in 1976 accusing software developers of using his BASIC software without paying for it. He argued that unlicensed use of software would discourage companies from investing time and money in developing high-quality software. Proprietary developers often come to understand problems as opportunities to build software packages that may solve a problem but also generate a profit by doing so.

13 This particular code of ethics was developed in the 1960s at MIT and is the idea that access to computers should be unlimited and information should be free. In this manner, developers try not to profit from information as proprietary developers might do, but instead try to add information to a public forum. Information is a public good and software problems may, subsequently, be conceived as information problems, leading to different approaches to solving problems (see Raymond (1999) for an excellent discussion of open source versus proprietary software development processes).
subordinate groups attempt to either defend or subvert each other’s legitimacy in on-going struggles, which are manifest in their everyday practices (Bourdieu, 1993b).

Fields are also relatively bounded social spaces not in terms of physical boundaries but in terms of institutionalized barriers to entry (Bourdieu & Wacquant, 1992). For example, to join the field of investment banking typically requires having an MBA degree from a highly ranked business school, which effectively excludes those who do not have that exclusive accreditation. This serves as a basis to determine which participants are able to play the game or are granted entry to the field. Bourdieu (1993b) notes that participants usually pay a significant entry fee in order to gain entry to a field, which legitimates the field itself. For example, the entry fee to join the field of academia is investing a significant amount of time and money getting a PhD degree. Once the degree is earned, newly minted PhDs typically do not engage in activities that might undermine the value of the degree or the value of the academic field, because doing so would mean devaluing the time and energy previously invested in getting the PhD. As such, this entry fee signifies a commitment to the game (field), which indirectly limits the use of subversive strategies that might diminish the value of previous time and monetary investments (Bourdieu, 1993b). In this manner, field level changes are typically explained not by challenging the very existence of the field, but rather by challenging the rules of the game (Bourdieu, 1993b).

To clarify this conceptualization of a field, Bourdieu uses an analogy of a soccer field (Bourdieu & Wacquant, 1992). A soccer game includes players (individual actors) occupying certain positions (keeper, defender, midfielder or forward), the relative positioning of the players on each team, the rules of the game, and the location of the ball (space of play). All of these factors determine an individual’s view of the game and what actions are possible or impossible in a given situation (space of possibles). The participants in a soccer game are selective (barrier
to entry), because there are only a fixed number of players on each team. In order to make a
team, for example, individual players typically invest a lot of time practicing (i.e. perfecting the
craft) in order to gain access to the field, which generally limits the use of subversive strategies
(i.e. cheating or “throwing a game”) that might hurt the existence of the game.

During the game, opponents try to improve their positions on the field by changing the space
of play by, for example, moving the ball from one end of the field to the other. Additionally, the
positions of the players on the field are the result of prior moves (i.e. player A passes the ball to
player B), so the playing field consists of accumulated histories of past actions. Certain teams
also have certain styles of play and ways of viewing certain situations (mental and bodily
schemata or habitus) that function as templates for practical game strategies (strategic orientation
toward the game). However, individual players often react to situations using their feel for the
game rather than calculations pertaining to each move (taken-for-granted dispositions). Each
soccer game has different stakes and values (friendly match versus highly competitive
tournament match) governing the play, which help determine which strategies (i.e. stop play for
an injured player or correct an erroneous call by a game official) are viewed as legitimate.
Although a soccer match is played between the lines (relatively fixed boundaries), the field often
extends beyond these immediate boundaries as there are typically league offices, business
partners, advertisers, and possibly players’ unions, and all of these groups have a stake in setting
the rules of the game and structuring the field.

The concept of the field has been extensively studied in a variety of disciplines. For
example, in the information systems literature Swanson and Ramiller (1997) discuss the
importance of trans-organizational fields in their organizing vision theory of diffusion of
innovations, and Lamb and Kling (2003) leverage the idea of fields in their reconceptualization
of users as social actors. In the organizational theory literature, Bourdieu’s conceptualization of the field has inspired many streams of research, most notably neo-institutional theory. In this research tradition, an organizational field refers to “those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products” (DiMaggio & Powell, 1983, p. 148). Organizational fields have been further conceptualized as business systems (Whitley, 1987) or industry systems (Hirsch, 1985), which include the totality of actors in a given business or industry. Key components of organizational fields include relational systems (DiMaggio & Powell, 1983; Fligstein, 1990; Scott & Meyer, 1991), governance systems (Brunsson & Jacobsson, 2002; Djelic & Sahlin-Andersson, 2006), cultural-cognitive systems (Fligstein, 2001; Friedland, 2009; Haveman & Rao, 1997), and organizational archetypes (Greenwood & Hinings, 1993). Organizational fields constitute the building blocks of social systems, because organizational fields situate organizations as actors within larger systems (Scott, 2008).

There are two main differences between fields as defined by Bourdieu and fields used by organizational and institutional theorists. First, Bourdieu focuses on symbolic power and authority as key components in structuring the field (Bourdieu & Wacquant, 1992). Bourdieu is focused on the importance of class differences associated with positions anchored with different mixtures of resources (i.e. forms of capital) within a field as factors in reproducing a social order (Bourdieu, 1977a). Fligstein and McAdam (2011) point out that institutional theorists such as Jepperson (1991) utilize more of a social constructionist conceptualization of fields. In this manner, it is the shared understandings among the actors in a field that result in certain sets of
social dynamics within fields as opposed to relationships between positions that have some objective existence regardless of the occupant of the position.

Second, Emirbayer and Johnson (2008) and DiMaggio and Powell (1991) note that fields as defined by Bourdieu have been somewhat misappropriated in the organizational and institutional literature, because the concept of the field has largely been detached from the concept of habitus or the subjective component of field structure. According to Bourdieu (1977b), a field is both an objective and a subjective structure. It is objective in the sense that the distribution of different forms of capital represent the external constraints governing interactions, but it is subjective in the sense that the lived experiences and the dispositions (behavioral tendencies) of individuals explain the categories of perceptions and appreciations that structure their action (Bourdieu & Wacquant, 1992). To account for this duality, Bourdieu uses habitus to relate individual practices with objective structures (DiMaggio, 1979), suggesting that habitus refers to the “internalization of externality” (Bourdieu, 1990b, p. 55). Habitus emerges in the interaction of fields and individuals and does not exist apart from the field, because social positions give rise to embodied dispositions and embodied dispositions also serve as a mechanism to structure the field (Bourdieu, 1993a). Wacquant (1989, p. 44) states:

The relation between habitus and field operates in two ways. On one side, it is a relation of conditioning: the field structures the habitus, which is the product of the embodiment of the immanent necessity of the field (or of a hierarchy of intersecting fields). On the other side, it is a relation of knowledge or cognitive construction: habitus contributes to constituting the field as a meaningful world, a world endowed with sense or with value, in which it is worth investing one’s energy.

There is a close dynamic between fields and habitus, because habitus is ingrained in daily interactions. The next section expands on the notion of habitus.
Habitus

Habitus is a core concept of Bourdieu’s integrated social theory, but it is also a concept that takes on many different definitions by Bourdieu himself and other scholars who use habitus in their theoretical and empirical research. Habitus is a concept that predates Bourdieu, having been studied in a wide variety of disciplines including philosophy (Aristotle), anthropology (Mauss), developmental psychology (Piaget) and art history (Panofsky). Brubaker (1993) posits that Bourdieu never intended for habitus to be defined in a concise and unambiguous manner while DiMaggio (1979, p. 1464) suggests that habitus is a “kind of theoretical deus ex machine.” Jenkins (1992, p. 130) further describes the conceptual ambivalence associated with the term as “the ontological mysteries of the habitus.” Yet, Reay (2004, p. 441) cogently states “paradoxically the conceptual looseness of habitus also constitutes a potential strength. It makes possible adaptation rather than the more constricting straightforward adoption of the concept within empirical work.”

This may be why so many different scholars have come to understand habitus differently. For example, Mahar (1990) refers to habitus as Bourdieu’s attempt to create social actors as individuals who socially construct the world around them, but Jenkins (1992) quite contrarily refers to habitus as an advanced form of functionalism or an elaborate mask for determinism. Many studies particularly related to the communities of practice literature discuss habitus as a structure emerging from practice while largely ignoring the possibility that habitus may be a generative structure (Mutch, 2003), which is not entirely consistent with the dual nature of habitus defined by Bourdieu. Wenger (1998, p. 289) also argues that habitus is a structure that emerges from interactional practices rather than as a structuring structure, thereby moving away
from Bourdieu’s idea that habitus is a relatively durable structure in and of itself (Bourdieu & Wacquant, 1992).

Habitus is the mechanism by which Bourdieu links practices (individual agency) with forms of capital and fields (structure) (Bourdieu, 1993a; Bourdieu & Wacquant, 1992). Habitus only becomes activated in relation to a specific field, and the same habitus may lead to different, possibly opposing, practices or points of view depending on the structure of the field (Bourdieu & Wacquant, 1992). To clarify, Bourdieu (1990b, p. 53) defines habitus as:

Systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles which generate and organize practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them. Objectively ‘regulated’ and ‘regular’ without being in any way the product of obedience to rules, they can be collectively orchestrated without being the product of the organizing action of a conductor.

There are several important points about habitus in this quite dense definition. First, habitus refers to systems whereby dispositions (ways of interpreting the world and behavioral tendencies) are, on the one hand, reflective of the social context in which they were acquired, but, on the other hand, serve as generative structures of broader social systems or the fields in which they operate (Bourdieu & Wacquant, 1992). Habitus is a process by which certain normative behaviors become embedded into a structure of dispositions, which are practically oriented towards certain goals (Lane, 2000). Second, habitus refers to durable and transposable dispositions meaning it provides enduring behavioral tendencies toward certain practices, which are used to make sense of the world in different social settings and fields (Bourdieu, 1993b). Dispositions, tastes and tendencies generally do not radically change, leading to a high degree of inertia based on prior acculturation and previous consumption patterns (Bourdieu & Wacquant, 1992). Bourdieu (1977b, p. 72) writes:
Through our dispositions, the most improbable practices are excluded as unthinkable, which inclines us to be predisposed to act in ways that we have done in the past. The habitus produces practices that reproduce the regularities of experience while slightly adjusting to the demands of the situation. In practice the habitus is history turned into nature. Our unconscious is therefore the unforgetting of our history turning our actions instead into second nature.

The familiarity and immediacy of corporeal experience are important components of habitus. Mental and corporeal representations associated with habitus are often unconsciously acquired through socialization, making them highly resistant to change (Mutch, 2003). However, although habitus is durable, it is not unchangeable. Habitus is “an open system of dispositions that is constantly subjected to experiences and therefore constantly affected by them in a way that either reinforces or modifies its structures” (Bourdieu & Wacquant, 1992, p. 133). It is not easy to change an individual’s habitus because it is acquired during early life (or professional) experiences (durable dispositions), but Bourdieu does not completely dismiss the possibility (Bourdieu, 1993b; Bourdieu & Wacquant, 1992). As such, habitus is often used in association with studies on reproduction (c.f. Katsillis & Rubinson, 1990; Schultze & Boland Jr., 2000a), but the concept may still be used to explain changes in behavioral inertia, particularly in situations when the structure of the field is not aligned with behavioral tendencies (Bourdieu & Wacquant, 1992).

Third, habitus refers to structured structures which function as principles in order to generate and organize practices, meaning that habitus is simultaneously a perceptual and classifying structure as well as a generative structure of practical action. The classifying function of habitus serves as a “description of what specifically characterizes ‘lived’ experience of the social world, that is apprehension of the world as self-evident, as ‘taken for granted’” (Bourdieu, 1990b, p. 25). In this manner, habitus is not manifest in formal rules but rather in habitual actions and schemes of perception that predispose certain forms of action (Bourdieu, 1993a). The generative
structure part of the definition is more abstract, but this conceptualization serves as the intersection of embodied structures-in habitus and objective field level structures, both of which are structures in and of themselves (Bourdieu, 1998). Habitus is a deep structure “historically constituted, institutionally grounded, and thus socially variable, generative matrix” (Bourdieu & Wacquant, 1992, p. 19), but are embodiments of the social structures which produced it.

Fourth, habitus may be considered active despite being largely taken-for-granted or unconscious (without presupposing a conscious aiming at ends). Habitus serves to organize mental representations that may be objectively adapted without presupposing a conscious thought process or the strict adherence to rules and regulations (Bourdieu, 1990b, p. 53). That is, practices have a common, taken-for-granted sense that has an objective meaning, which is understood to be without rational intention. Bourdieu (1990a, p. 77) states:

The habitus, as a system of dispositions to a certain practice, is an objective basis for regular modes of behavior, and thus for the regularity of modes of practice, and if practices can be predicted … this is because the effect of habitus is that agents who are equipped with it will behave in a certain way in certain circumstances …This means that the modes of behavior created by the habitus do not have the fine regularity of the modes of behavior deduced from a legislative principle: the habitus goes hand in glove with vagueness and indeterminacy.

Although social agents may not be completely rational in the economic sense, they act in a reasonable manner, because they have internalized and conditioned certain courses of action that may be applied to specific situations and circumstances (Bourdieu & Wacquant, 1992). Habitus “obeys a practical logic, that of vagueness, of the more-or-less, which defines one’s ordinary relation to the world” (Bourdieu, 1990a, p. 78). This is particularly relevant to the information systems literature, because decisions, particularly those related to software design, are often made based on taken-for-granted assumptions based on one’s ordinary relation to the discipline (Steingruebl & Peterson, 2009; Wendorff, 2002).
Fifth, Bourdieu strongly argues against action being an orchestrated response to a set of societal rules (*without being in any way the product of obedience to rules*). Bourdieu argues that habitus regulates practices by transforming positions in a field into individual member dispositions without being the product of rules and regulations (Friedland, 2009). While his body of work analyzes social stratification and the role that habitus plays in reproducing those social inequalities, he rejects the Marxian visions of economic class divisions within society (Bourdieu, 1990b). Bourdieu argues against the idea that actions are the basis of a rational risk based calculation and strict adherence to economic rules (Bourdieu, 1990a; Bourdieu & Wacquant, 1992). Instead, Bourdieu suggests that the habitus produces reasonable expectations, which may be adapted from situation to situation (Emirbayer & Johnson, 2008). The logic of habitus means that individuals are capable of habitually responding to situations involving problems of anticipation of opportunities, which may not be resolved through an a priori rational calculation (Bourdieu, 1990b). For example, within a virtual community of practice (vCoP) or an eNoP I argue that participants may not be able to calculate the costs and benefits associated with voting another member’s contribution positively (up) or negatively (down) or responding to a particular message in an exacting manner, but members may instead act based on reasonable expectations, which are not the product of conscious, intentional search for adaptation within the vCoP or eNoP.

Trice (1993) defines occupational cultures in terms of ideologies and cultural forms. He defines ideologies as those moral obligations that members of an occupation should hold toward one another and those with whom members interact (Trice, 1993). An example of one of the many different ideologies in software development is the idea that software should be free and source code should be open for anybody to access. Cultural forms symbolically convey
ideological meaning usually in the form of rituals, ceremonies, myths, symbols, and so on (Trice, 1993). Within software development, one myth is the idea that “given enough eyeballs, all bugs are shallow” (Raymond, 1999, p. 23). This myth may very-well be true, but it is myth-like in terms of how open source developers use this mantra to legitimize their software development ideology. Although Bourdieu is not specifically theorizing about ideology, ideology and habitus are related concepts in his social theory. Ideology links habitus to social norms and the quest from ideological legitimation by classes or positions within a given social space (Bourdieu & Wacquant, 1992).

Many organizational studies tend to ignore habitus in favor of focusing on fields and forms of capital (DiMaggio, 1979; DiMaggio & Powell, 1991; Emirbayer & Johnson, 2008), but a position in a field is a disposition that is only active to the extent that it is embodied as habitus (Bourdieu, 1998; Friedland, 2009). Positions in a field are not only associated with the class habitus that is normally associated with that position, but also with the accumulation of different forms of capital that constitute the given position. The different forms of capital represent power over a field whereby individuals in positions of power seek to preserve their power and legitimize their habitus (Bourdieu & Wacquant, 1992; Corsun & Costen, 2001).

**Forms of Capital**

With his theory of capital, Bourdieu is challenging traditional economic notions of capital, market equilibrium, and profit by suggesting individuals are not solely trying to maximize economic profits in their endeavors (Bourdieu, 1986). He argues that other forms of capital such as social and cultural may secure profits or be perceived as valuable in certain fields, and these other forms may also distinguish different classes or groups of people within those fields (Bourdieu, 1993b). Other forms of capital, just like economic capital, are unequally distributed
in society (Bourdieu, 1986). He argues that capital in all of its forms takes time to accumulate and, as such, society cannot “be reduced to a discontinuous series of instantaneous mechanical equilibria between agents who are treated as interchangeable particles” (Bourdieu, 1986, p. 241). At any given point in time, all potential actions are not equally possible or impossible based on the unequal distribution of capital, and the different forms of capital represent “the immanent structure of the social world, i.e., the set of constraints, inscribed in the very reality of that world, which govern its functioning in a durable way, determining chances of success for practices” (p. 242).

Bourdieu argues that certain types and combinations of capital along with certain habitus’ lead to an ability to understand the field or to determine whether an individual has “basic minimum of chances in the game, and therefore power over the game” (Bourdieu, 2000, p. 223). In this manner, in order for an actor to play in a given game (field), she must have at a minimum some accumulation of economic, cultural and social capital. Different types of capital offer different principles of differentiation (Bourdieu & Wacquant, 1992). Bourdieu (1986, p. 243) specifically defines the three primary forms of capital as the following:

- as economic capital, which is immediately and directly convertible into money and may be institutionalized in the forms of property rights; as cultural capital, which is convertible, on certain conditions, into economic capital and may be institutionalized in the forms of educational qualifications; and as social capital, made up of social obligations ("connections"), which is convertible, in certain conditions, into economic capital and may be institutionalized in the forms of a title of nobility.

Bourdieu later defines symbolic capital as capital in either the economic, cultural or social forms to the extent that it is positively recognized in the field. In the business literature, symbolic capital is often manifest in similar yet conceptually distinct concepts such as reputation (Bromley, 1993; Fombrun & Shanley, 1990), status (Podolny, 2005; Ridgeway & Berger, 1986), or branding (Aaker, 1992).
Cultural capital is most closely related to habitus as it is often reflected in behaviors, knowledge, or dispositions acquired quite unconsciously through socialization (Bourdieu, 1993a; Bourdieu & Wacquant, 1992). It may also be acquired over time via investments in formal or informal education (Bourdieu, 1986, 1993b). Bourdieu (1986) proposes that cultural capital may exist in three forms. First, cultural capital may be embodied in the properties of oneself. These properties may be either actively acquired through education or passively acquired through socialization. Bourdieu (1986) points out that embodied cultural capital is difficult to exchange because it is embedded in the individual. This is very similar to the idea of embodied habitus. Embodied habitus refers to ways of eating, standing, speaking, gesturing, walking, and so on that distinguish different classes of people in society (Bourdieu, 1977a, 1986, 1993a). For example, wealthy individuals have different mannerisms and different overall social presence, then, say, working class individuals. These different classes of individuals have different amounts of embodied cultural capital.

Second, cultural capital may be objectified in the form of material objects, and this form of cultural capital is exchangeable through its materiality (Bourdieu, 1993a). Objectified cultural capital may also be exchanged symbolically in its embodied form (Bourdieu, 1986). Third, cultural capital may be institutionalized typically through academic credentials or otherwise legally guaranteed qualifications, which are officially recognized in a specific field. This differs from embodied cultural capital, because embodied cultural capital is constantly required to prove itself as legitimate in a given field (Bourdieu, 1986, 1993a). Cultural capital and habitus are acquired through socialization processes primarily associated with family or the social class that the individual is a part of (Bourdieu, 1977a).
There may be certain exclusive advantages based on the limited number of people who have access to those cultural capital resources (Bourdieu & Passeron, 1990). For example, Lareau and Weininger (2003) argue that cultural capital is a resource that may be monopolized by individuals or groups of individuals. The holders of that capital may be able to generate profits through the symbolic exchange of those habits and dispositions (Lareau & Weininger, 2003). Bourdieu (1977a) argues that educational systems tend to channel individuals towards positions in society that mirror the family or general class origins of the students. As such, Bourdieu (1977a) argues that cultural capital is at the center of the reproduction of social stratification in modern society. Eyal, Szelenyi and Townsley (2000) demonstrate that in countries such as Czechoslovakia and Hungary a cultural bourgeoisie developed when these countries switched from a communist system to a capitalist system. It was the cultural bourgeoisie as opposed to the economic bourgeoisie that monopolized the cultural capital associated with the capitalistic society, which opened up doors to lucrative opportunities in the new economy (Eyal, et al., 2000). For the purposes of this study, the key point is the idea that cultural capital is an important factor in the stratification of the field above and beyond the economic and social dimensions of field stratification.

Bourdieu (1986, p. 51) defines social capital as “the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group.” He goes on to argue that the amount of social capital that an individual has depends on the size of the network connections as well as the amount and composition of economic, cultural, and symbolic capital that his/her connections have. Just like certain forms of cultural capital are exchangeable for economic capital, Bourdieu (1986) makes a similar argument for social capital.
What is important about Bourdieu’s conceptualization of social capital is that it assumes resources may be exchanged between social connections and the amount and quality of the resources are important facilitating conditions for the exchange (Portes, 1998). He implicitly assumes that group members maintain strong and reciprocal relationships with one another (Lin & Erickson, 2008).

Social capital has been extensively studied in the literature. It has been investigated at many different levels of analysis, from the individual to the collective to the relationship level (c.f. Burt, 1992; Coleman, 1988; Portes, 1998; Putnam, 2000). Social capital has also been found to have many benefits including (among many others) resource exchange and product innovation (Hansen, 1999), finding new jobs (Granovetter, 1973), supplier relationships (Uzzi, 1997) and reducing employee turnover rates (Krackhardt & Hanson, 1993). In the information systems literature, social capital has been used as the theoretical lens in order to explain motivations for sharing knowledge in variety of electronic social structures (Chiu, et al., 2006; Kankanhalli, et al., 2005; McLure Wasko & Faraj, 2005; Widen-Wulff & Ginman, 2004), learning in virtual learning communities (Yuan, Gay, & Hembrooke, 2006), and team integration within information systems project teams (Newell, Tansley, & Huang, 2008).

**Applying Bourdieu’s Social Theory to Voting Practices in eNoP**

Bourdieu’s integrated social theory has been used to explain social inequality in a broad range of fields including education, cultural production, Algerian culture, tastes, French intellectuals, and fine arts and in a variety of disciplines most notably anthropology, linguistics, and sociology (Bourdieu & Wacquant, 1992). Although an eNoP does not represent the typical stratified social structure explained using Bourdieu’s integrated social theory, social inequalities exist within eNoP and within other virtual environments (Ahuja & Carley, 1998; Crowston &
Kammerer, 1998; Weisband, et al., 1995). Furthermore, his theoretical perspective on social inequalities offers explanations at both the micro (forms of capital) and the macro (fields) levels of analysis while using habitus to bridge the gap between those two levels (Emirbayer & Johnson, 2008). These multiple levels of analysis are relevant to eNoP, because macro factors such as the structure of the network and the structure of community (Butler, 2001; Ransbotham & Kane, 2011; Whelan, 2007) and individual factors such as identity construction and anticipated emotions (Bagozzi & Dholakia, 2002; Ma & Agarwal, 2007) have been found to impact social dynamics within a variety of different virtual environments.

Bourdieu’s integrated social theory is specifically applicable to voting practices in peer-to-peer feedback systems for several reasons. First, votes are the currency of exchange and the accumulation of votes are unevenly distributed among eNoP members. Therefore, the membership is socially stratified based on aggregated votes. Second, Barnett and colleagues (2010) along with Stewart and Gosain (2006) empirically demonstrate that status within open source development communities is often competed for on an ideological level. Their results suggest that status seeking may not be limited to just the individual level as competitions are often manifest in higher (group) level competitions as well. Therefore, understanding how higher level factors such as habitus impact voting behaviors is relevant.

Third, it is necessary to situate interaction patterns between individuals and groups in relation to the field which governs the electronic social structure. Previous literature has demonstrated that online and offline institutional structures (which Bourdieu’s general social theory provides a foundational set of principles) are important factors governing social behaviors in virtual environments (DiMaggio, et al., 2001; Hercheui, 2011). Alexander and Smith (2002, p. 136) state that “a belief in the possibility of a cultural sociology implies that institutions, no matter
how impersonal or technocratic, have an ideal foundation that fundamentally shapes their organization and goals and provides the structured context for debates over their legitimation.”

As such, debates over legitimation are debates over the meaning of the symbolic representations, which results in some form of symbolic power or authority of one group over another group (Bourdieu, 1989). Symbolic power is interpersonal in nature focusing on the uneven distribution of different forms of capital and the struggle for symbolic profits within a given social space (Bourdieu, 1989; Bourdieu & Wacquant, 1992). Furthermore, symbolic profits are most easily measured and observed in terms of the public score keeping mechanisms (peer-to-peer feedback systems) on these sites.

**Group Style and Culture in Interaction**

Although I have just argued that Bourdieu’s integrated social theory is very relevant to voting practices, using Bourdieu alone may not be sufficient in order to explain positive and negative voting practices within eNoP. According to many of Bourdieu’s critics, habitus may be interpreted as a sophisticated form of objectivism (despite Bourdieu’s claims to the contrary) whereby habitus is acquired objectively through class distinctions (c.f. Brubaker, 1993; DiMaggio, 1979; Jenkins, 1992; King, 2000). King (2000), for example, argues that individuals do not act on the basis of internalized predisposed courses of action (imposed upon unconsciously by an objective class structure) as Bourdieu’s theory of habitus might suggest. He states the following:

Individuals do not solipsistically consult *a priori* rules which then determine their action independently, but rather individuals act according to a sense of practice which is established and judged by the group. The final determination of correct action is not whether one rigorously followed an *a priori* rule but rather whether one’s actions are interpreted as appropriate and proper by other individuals. Other individuals – the group – decide whether an action is acceptable or sanctionable, given their shared sense of honor; they call those individuals to order who have acted against this socially agreed sense of honor (King, 2000, p. 420).
In the sociology of voting literature, groups, the general social context and socialization within groups have been demonstrated to be important factors in determining political voting behaviors (Zuckerman, 2005). Berelson, Lazarsfeld, and McPhee (1986), for example, argue that the process of talking to one another in specific group settings converts the vague dispositions that people have into specific attitudes, acts, or votes. In this manner, just as the above quotation from King (2000) illustrates, the group ultimately determines what actions (or votes in this case) are deemed acceptable more so than (or in conjunction with) an individual’s habitus (Eliasoph & Lichterman, 2003). The political science literature demonstrates that socialization and group membership play a significant role in determining voting practices, because socialization within groups often leads to interactions with other individuals who share common interests, beliefs, values and attitudes (Evans, 2004). Those common interests are often manifest in similar voting practices within socially similar groups (Evans, 2004; Kau & Rubin, 1979). Bourdieu’s integrated social theory refers to socialization within the macro social structure (particularly macro level class distinctions) and the transposability of habitus from one context to another context in determining an individual’s actions and behaviors (Bourdieu & Wacquant, 1992).

In this manner, I argue that Bourdieu’s holistic approach to understanding behavioral tendencies in the form of class distinctions between individuals and groups may not adequately account for emic differences in specific group contexts when interpreting individual actions and behaviors. Hall (1992, p. 260), for example, states that “heterologous ‘markets’ and ‘currencies’ of cultural capital interfigure with one another in ways that do not reduce to a single calculus of distinction.” In essence, this means that there may be other sources of behavioral tendencies not
specifically related to class distinctions. To account for these other factors, I turn to Eliasoph and Lichterman’s (2003) conceptualization of group style and culture in interaction.

Eliasoph and Lichterman (2003, p. 737) define group style as “recurrent patterns of interaction that arise from a group’s shared assumptions about what constitutes good or adequate participation in the group setting.” They argue that group styles, just like collective representations and habitus, are important elements of culture. They further postulate that group style consists of three dimensions (group boundaries, group bonds and speech norms). Group boundaries refer to a group's assumptions about what the group's relationship to the wider world should be while interacting in a group context. Group bonds refer to a group's assumptions about what members' mutual responsibilities should be while interacting in a group context. Speech norms refer to a group's assumptions about what appropriate speech is while communicating in a group context. In essence, the style of the group and the interaction patterns within the specific group context serve as filtering mechanisms for collective representations and habitus resulting in culture in interaction (Eliasoph & Lichterman, 2003).

A member of a group may violate one or all of these dimensions of group style when interacting in a group context (Eliasoph & Lichterman, 2003). For example, in the context of a discussion forum within an eNoP, a member may violate the speech norms by using language that is deemed inappropriate in the specific context such as not using proper punctuation or writing in text message format, but the content of the post may not violate the group bonds or the group boundaries. Different groups and different occupational cultures may have different group boundaries, group bonds and speech norms, but violating any dimension of that group style (whatever it may be) impacts how others in the group view the violator (Eliasoph & Lichterman, 2003). Furthermore, the political science literature has demonstrated that the closer an individual
is to a particular group, the higher the propensity that he/she will behave and vote in ways that distinguish members of the group from non-members (Campbell, Converse, Miller, & Stokes, 1960), which may impact how an individual may vote for or against members and non-members of a group.

**Research Model**

The goal of this study is to utilize a cultural sociology perspective in order to explain voting practices (positive and negative votes) within peer-to-peer feedback systems within eNoP. I am specifically utilizing Bourdieu’s integrated social theory and Eliasoph and Lichterman’s concept of culture in interaction (group style) in order to explain why a post receives either a positive or a negative vote. I am specifically investigating voting practices in peer-to-peer feedback systems where the voting is binary (either positive or negative), but the model would certainly apply to voting done on a continuous scale (i.e. likelihood that a vote would be closer to the top (positive) or bottom (negative) end of a continuous scale). The research model is shown in Figure 4. The hypothesized relationships depicted in Figure 4 relate to the propensity of a negative vote in the peer-to-peer feedback system. Predicting the propensity of a positive vote would simply reverse the sign of all hypotheses. I am also theorizing about how these types of systems are being used (actual votes) and not system non-usage (i.e. members choosing not to vote). A member may choose not to vote for a similar or a different set of factors.

I theorize that a portion of the variability in the propensity to give and receive positive and negative votes in discussion forums within eNoP may be explained by examining the post in relation to the group style (group bonds, language norms and group boundaries) of the discussion forum, the social class of the receiver of feedback (author of the post), the social class of the
giver of feedback (voter), and the practice-related (professional) habitus differences between the giver and receiver of feedback.

Figure 4. Voting Practices Research Model

**Habitus Main Effect Hypothesis**

Socialized dispositions deposited in individuals in the form of habitus provide important psychological resources that impact behaviors (Henry, 2004). In the economics literature, Stigler (1971) argues that voting practices may be explained almost entirely on the basis of economic self-interest (calculation of expected costs and benefits), but Kau and Rubin (1979) demonstrate empirically that other factors such as ideology are important factors to consider when analyzing political voting practices (even after controlling for economic self-interest). The social context,
social structure, and institutional effects impact voting practices (Evans, 2004), and habitus is embedded in the social structure.

Bourdieu (2005) empirically demonstrates that internal debates within organizations (exemplified by his research on a cement-production company) are often linked with each manager’s external trajectories, such as their educational background through which an individual’s professional habitus is acquired. In this manner, configurations of relationships “tend to display a structure of opposition roughly homologous to that found within the fields that are the source(s) of the most important forms of capital and habitus” (Emirbayer & Johnson, 2008, p. 28). In a study of the use of symbolic power within a negotiation context, Hallet (2003) similarly found that organizational actors act on the basis of both formal organizational rules as well as their habitus in order to create practices of value within organizations.

In the context of open source developers, Barnett and colleagues (2010) argue that positively voting an individual with a competing ideology is tantamount to negatively voting his/her own ideology. This is logical, because certifying (positively voting) someone with a competing ideology (or class habitus) increases the social standing of, not only the individual being certified, but also of the group to which the ideology (or class habitus) belongs. Those groups in control of the optimal mix of capital resources “gain thereby the capacity to determine, within the field in question, the relative values of all other kinds of resources, such as the value of financial or legal as opposed to technical or political capital, within the overall distribution of capital that constitutes the state of power relations within that field” (Emirbayer & Johnson, 2008, p. 13). As such, social games are competed for on both a dyadic level between the giver and receiver of feedback and on a higher ideological (Barnett, et al., 2010; K. J. Stewart &
Gosain, 2006) or collective habitus level (Bourdieu & Wacquant, 1992). This leads to the following hypothesis:

\[ H1: \text{The giver of feedback will have a higher propensity to negatively vote a post authored by an individual (receiver) when the professional habitus differences between the giver and receiver are greater.} \]

**Group Style Main Effect Hypotheses**

Based on the types of practices that are being rewarded with positive votes and punished with negative votes within these peer-to-peer feedback systems, a culture may emerge with a well-defined social hierarchy and group style, which gets produced and reproduced through usage patterns within these systems. King (2000, p. 420) states that individuals “learn how to act from others (rather than being imposed upon by an objective structure as the habitus suggests), their repertoire of permitted actions is circumscribed by a particular cultural horizon.” The emic interaction patterns of the group may impact how individuals behave in a given group context (Hall, 1992). For example, certain trolling\(^ {14} \) or otherwise deviant behaviors might be considered normative and may be rewarded with positive votes in one group context such as 4chan\(^ {15} \), while these types of behaviors might generally be considered counter-normative and may consequently be punished with negative votes in a different group context such as [www.codeproject.com](http://www.codeproject.com) or [www.stackoverflow.com](http://www.stackoverflow.com). Eliasoph and Lichterman (2003) would explain these differences in relation to the different group bonds, speech norms and group boundaries within these sites. They demonstrate in their two in-depth case studies of two distinctly different offline social groups with very different cultures that members who violated the group style were met with awkward silence or rejection from the other group members (Eliasoph & Lichterman, 2003).

\(^ {14} \) Trolling refers to general deviant behavior or deliberately performing actions that may make other participants angry.

\(^ {15} \) 4chan is a public forum where most users post anonymously and many discussion threads result in name calling, trolling or otherwise juvenile social interactions. The anonymous nature of the site often attracts trolls or other forum deviants to discussion threads.
This effect was apparent in their analyses, regardless of the social status or class of the violator of the group style. This leads to the following hypotheses:

\[ H2(a)(b)(c): \text{When a post violates the (a) group bonds, (b) speech norms, (c) group boundaries within a specific group context, the author of the post will have a higher propensity to receive a negative vote.} \]

**Interaction of Group Style Violations and Professional Habitus Differences Hypotheses**

I further expect violations of group style (along any dimension of group style) to exacerbate the impact that professional habitus differences have on the propensity of receiving a negative vote. Triandis (1994) argues that predictability in other’s behavior leads to familiarity and trust, while unpredictability often leads to group conflicts and tensions between group members. I expect violations of the group style to reduce the predictability of behaviors (of the violators) thereby increasing the impact that habitus differences have on the propensity of receiving a negative vote. I expect small professional habitus differences to be amplified in the presence of a group style violation, because the group style violation may make other dispositional differences more salient when they may otherwise be unnoticeable due to behavioral predictability. This leads to the following hypotheses:

\[ H3(a)(b)(c): \text{Posts that violate the (a) group bonds, (b) speech norms, (c) group boundaries within a specific group context will amplify the impact that small professional habitus differences have on the propensity to receive a negative vote.} \]

**Receiver of Feedback Forms of Capital Hypothesis**

Those actors who have the optimal mixture of different forms of capital are in a much better position to succeed in a given field (Bourdieu, 1986). In this sense, the “game is rigged” to favor those who have the appropriate capital resources relative to those who do not (Bourdieu & Wacquant, 1992). The appropriate capital resources in eNoP with peer-to-peer feedback systems are votes and other symbols/badges associated with the accumulation of votes. Certain
individuals may be culturally or socially disadvantaged due to their low scores in these systems. Previous research in a variety of contexts has demonstrated that individuals tend to favor other individuals who have been most successful in the past with additional attention (DiPrete & Eirich, 2006). In essence, these types of ‘score-keeping’ systems promote a form of Matthew effect or cumulative advantage (Merton, 1968). Cumulative advantage is a mechanism for inequality across any temporal process where a favorable relative position becomes a resource that produces future relative gains (DiPrete & Eirich, 2006). In this case, the mechanism for inequality is the visible display of each member’s score in the peer-to-peer feedback system (sum of total positive votes minus sum of total negative votes), which may serve to produce additional positive votes or additional negative votes through a process of differential association (Gould, 2002). This leads to the following hypothesis:

\[ H4: \text{The more symbolic capital that the author of a post (receiver) has accumulated at the time of the vote, the lower the propensity to receive a negative vote.} \]

**Giver of Feedback Forms of Capital Hypothesis**

In peer-to-peer feedback systems where voting is done in a binary manner (either positive (up) or negative (down)), down voting other members seems to be a counter-normative practice. For example, within the peer-to-peer feedback system at TPC (which has a binary voting system), only 7% of all votes across all of their forums were negative (as of 4/15/2011). I propose that giving a negative vote may be indicative of one’s social class (low-brow cultural practice) within a particular eNoP. This is consistent with Kvasny and Truex III (2000) who argue that technology usage is a cultural good, which serves as a marker of class distinction. I argue that high class members (i.e. those members with a high number of votes) of the eNoP have the habitus necessary to play the culture game, which means not publically down voting other members in a crude and unsophisticated manner. Low class members of the eNoP, on the
other hand, do not have the cultural codes and habitus necessary to act in a sophisticated and cultured manner, and, therefore, may be more likely to down vote fellow eNoP members within the public feedback system. Furthermore, negative votes fulfill a social function of legitimating differences between different classes of members in a similar manner as tastes and cultural consumption tend to correlate with an individual’s fit within a society (Bourdieu, 1984).

Bourdieu states that “players can play to increase or to conserve their capital, their number of tokens, in conformity with the tacit rules of the game and the prerequisites of the reproduction of the game and its stakes; but they can also get in it to transform, partially or completely, the immanent rules of the game” (Bourdieu & Wacquant, 1992, p. 99). In the case of peer-to-peer feedback systems, the tacit rule of the game is to use these systems for positive votes and not negative votes. This type of usage favors those members who have already accumulated a large bank account of votes, because there appears to be minimal risk associated with losing votes (accumulating negative votes). I propose that low class members of the eNoP may use the act of giving a negative vote in order to attempt to level the playing field or to change the rules of the game. More negative votes may serve to reduce the Matthew effect that is perpetuated by these systems, which is beneficial to those low class members of the eNoP. This leads to the following hypothesis:

\[ H5: \text{The more symbolic capital that the giver of feedback has accumulated at the time of the vote, the lower the propensity to give a negative vote.} \]

Research Design and Methods

This research model was analyzed empirically in an in-depth study of the voting practices at TPC, a large eNoP of software developers. TPC has been in existence since 2001 and has over 525K registered members as of April 2011 with discussion forums in a variety of programming languages ranging from scripting languages such as Perl and PHP to object oriented languages.
such as Java and C++. The site also contains off-topic (discussions about politics, religion, sports and so on) and technology industry related discussion forums (not related to the programming question and answer forums). The general IT topic forum (referred to as the TPC Cubicle in the remainder of this study) where members may discuss non-programming specific topics such as enterprise applications, new technology product announcements, technology consulting, IT project work, and other IT topics was the focus of investigation for this study.

This forum within TPC was selected for several reasons. First, this forum is an active forum within TPC where there was sufficient posting activity for me to determine the group style. Second, a member’s contributions within this forum are related to the member’s overall knowledge of the IT industry, which is indicative of a member’s value to the practice-side of the eNoP. Whereas the accumulation of votes within the off-topic sections of the site may be indicative of the social value a member has within the eNoP, the accumulation of votes in the TPC Cubicle is indicative of the practice-related value a member has within the eNoP. Third, many electronic social structures are not organized in question and answer formats like eNoP. Therefore, investigating voting patterns in this forum may help relate these findings to other non-practice related electronic social structures, which may not be organized around question and answer forums but where members still share a common cultural affinity.

The peer-to-peer feedback system under investigation in my study was implemented in 2008. This version of the system allows any registered member to vote content (any thread post) made by other members either up or down (in a binary manner), and the system is fully transparent in the sense that any member or guest may view the date, the thread, the post, and the members who received and gave the positive or negative vote. This system does not offer the ability to leave comments (i.e. free form text field along with the positive or negative vote), unlike some
peer-to-peer feedback systems, particularly in electronic marketplaces. The system does not attempt to filter votes in or out based on any algorithm, instead opting for an unfiltered, uncensored system. A voter, however, may only have one vote on a single post, meaning it is not possible to up or down vote another member multiple times on the same post. Each member’s score in the peer-to-peer feedback system (sum of total positive votes minus sum of total negative votes) is visibly displayed next to all of his/her posting activity. The system also rewards members based on their scores in the peer-to-peer feedback system by giving members titles such as guru or craftsman based on a specified score within the system (see Table 18 toward the end of this section for details concerning the member titles and range of scores associated with each title).  

All voting activity in the peer-to-peer feedback system in the TPC Cubicle between March 1, 2011 and May 31, 2011 (based on the date of the vote and not based on the date of the post) were downloaded and analyzed in this study. This time period represents a typical three month period in terms of the number of posts that take place in the TPC Cubicle. Additionally, there was a sufficient sample of positive and negative votes during this three month time period to test my research model. Several votes contained either a giver of feedback (voter) or a receiver of feedback with a blank or deleted profile, so those interactions were excluded from the data analysis. In total, 107 interactions (102 positive votes and 5 negative votes) were removed. The resulting data set included 1,306 votes (116 negative votes and 1,190 positive votes) across 688 posts between 1,011 unique combinations of members (158 unique feedback receivers and 177

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16 Information about the peer-to-peer feedback system was obtained from documentation of the system at TPC and from threads where members and site administrators discussed the peer-to-peer feedback system.

17 Based on the terms of use for this site at the time of the study, no automated scripts were permitted to be used to download any data from the site. As such, in order to comply with these terms of service guidelines and the recommendations for ethical use of digital data specified by Allen et al. (2006), I used a manual data collection process. The manual download process did not put any excessive load on their servers as the collection effort was spread out over several months. The University of Hawai‘i at Mānoa Institutional Review Board approval for this study is in Appendix A.
There were 233 unique members in my final sample. Based on voting data for these 233 unique members between March 1, 2011 and May 31, 2011, roughly 6% of all votes across all forums at TPC were negative, while 9% of votes in the TPC Cubicle were negative (not including the 107 excluded votes).

**Group Style**

Determining and coding each post receiving a vote against the group style for this forum involved two steps. First, I had to determine the group style of this particular discussion forum before determining whether a post violated any one of the three group style dimensions. In order to do this, I read all (non-archived) discussion threads between 1/1/2011 and 2/28/2011 and between 6/1/2011 and 8/31/2011 in the TPC Cubicle in order to determine the group bonds, speech norms, and group boundaries for this particular discussion forum. This process resulted in 188 discussion threads and 1,805 responses to those discussion threads from which I determined the group style (61 threads and 607 responses in the time period before and 127 threads and 1,198 responses in the time period after). These two time periods represent the two months before and the three months after my voting observation period. I choose time periods immediately before and immediately after my voting observation period, because I wanted to ensure that the group style was the same throughout my observation period. If, for example, I observed differences in the group style during the period immediately following my voting observation period, then that might mean that the elements of group style used to code the violations would be different for voting interactions occurring at the end of my voting observation period relative to those occurring at the beginning of the observation period (this was not the case in my data). I also wanted to ensure an adequate sample of discussion threads to determine the group style for the TPC Cubicle.
In order to determine the group style of the TPC Cubicle, I was a non-participating observer of the group style within the TPC Cubicle during these two time periods. I observed what people did in terms of their posts (use of language, types of topics, types of responses and so on) in the TPC Cubicle. I also observed what other members said concerning specific posts and the posting styles of those posts. For example, members would routinely respond to posts written in ‘text message’ format or posts with excessive emoticons with comments such as “we don’t do that around these parts” or “what’s up with all of the emoticons?” Members would often explicitly ‘call out’ other members when they did something that was out of the norm. Most of my conclusions concerning the group style came from members directly complaining about posts or other members when those members did something out of the norm for this particular forum. Some of my findings, however, came from my observations (and not direct commentary about a behavior). For example, in order to determine the group boundaries concerning how this group of programmers related to other fields and professions (outside of this eNoP), I observed threads where members discussed programming projects that they worked on. In these threads, members often discussed their experiences working with clients, and the members that participated in these types of discussion threads complained about their clients in terms of not having enough ‘basic’ IT knowledge to solve very routine problems. From these types of discussion threads, I concluded that this group of programmers tends to look down upon other disciplines, which is related to the group boundaries of the TPC Cubicle.

In order to challenge my findings concerning the group style, a second academically qualified researcher analyzed a subset of discussion threads (from the same two time periods) in relation to the group bonds, speech norms, and group boundaries of this forum. The second
researcher confirmed my findings and added an additional speech norm and group bond. The results from this exercise are displayed in Table 15.
Table 15. Group Style within the TPC Cubicle

<table>
<thead>
<tr>
<th></th>
<th><strong>SPEECH NORMS</strong></th>
<th><strong>GROUP BONDS</strong></th>
<th><strong>GROUP BOUNDARIES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eliasoph &amp; Lichterman’s</td>
<td>A group's assumptions about what appropriate speech is in the group context</td>
<td>A group's assumptions about what members' mutual responsibilities should be while in the group context</td>
<td>A group's assumptions about what the group's relationship to the wider world should be while in the group context</td>
</tr>
<tr>
<td>(2003) definition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sample of</strong></td>
<td>Normative use of language includes:</td>
<td>Members have a responsibility to:</td>
<td>Group Boundaries include:</td>
</tr>
<tr>
<td><em>group style</em></td>
<td>(1) Posts that are neither excessively long nor short</td>
<td>(1) Make insightful comments pertaining to the topic of the thread</td>
<td>(1) Posting topics in the correct forum within TPC</td>
</tr>
<tr>
<td></td>
<td>(2) Posts that use minimal chains of quotations</td>
<td>(2) Keep the mood fairly light but on point</td>
<td>(2) Posting links only internal to TPC (i.e. No self-referral links or links to competing eNoP)</td>
</tr>
<tr>
<td></td>
<td>(3) Proper punctuation and capitalization (within reason)</td>
<td>(3) Not lobby for votes in the peer-to-peer feedback system</td>
<td>(3) Discussing non-technical disciplines as inferior to programming</td>
</tr>
<tr>
<td></td>
<td>(4) Judicious use of emoticons</td>
<td>(4) Start threads which may generate significant discussion</td>
<td>(4) Discussing only ethical issues related to the IT discipline (Taboo topics include the creation of malware or viruses)</td>
</tr>
<tr>
<td></td>
<td>(5) Occasional use of crude/foul language</td>
<td>(5) Have a degree of respect for thread participants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6) Use of spoiler tags</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7) Matching the title of the thread with the purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sample of</strong></td>
<td>Members directly responding to or complaining about posts that violated the speech norms or the group bonds</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Evidence</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) “we don’t do that around these parts” or “we use spoiler tags in here”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) “what’s up with all of the emoticons?” or “what’s up with the embedded quotations?”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Some of the responses used crude/foul language to identify that a previous post was out of the norm. This type of foul language was used most frequently with posts concerning the feedback system and why a particular post received negative votes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) “I stopped reading after the first sentence in that wall of text”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Observations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Posts using foul language in order to make a point in a post were not met with any complaints from other members and were common.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) A moderator would frequently remark that he/she changed the title of the thread to match the actual topic of the thread.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Members who started discussion threads with minimal discussion value were personally attacked (“hey moron or idiot” or “why was this thread started?”)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Members responding to posts related to group boundaries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Other threads involved members directly commenting about the hubris and egos in the programming profession. For example, “I don’t want to go into the programming forums because I am scared someone will think I am dumb.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Comments such as “did you try posting that one of the java forums where it belongs” or “take this thread to the [TPC café]”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I then determined whether each post that received a vote violated one or more of these dimensions of group style. A simple binary variable was used for each dimension of group style. A zero means that the post did not violate that particular dimension of group style and a one means that there was a violation. A post was coded as violating one of the dimensions of group style regardless of how many aspects of that dimension were violated. For example, a post that was written in ‘text message’ speech and used an excessive number of emoticons was coded as violating the speech norms of the TPC Cubicle in the same manner as a post which only violated one of the speech norms. This coding method was chosen because there were so few posts that violated more than one element of each dimension of group style, meaning a continuous variable would have been highly skewed. Each dimension of group style is independent and one post may violate none of the dimensions or any combination of the three dimensions.

In order to code the posts against these dimensions of group style, I used three coders (myself included). The three coders first coded 73 posts receiving votes together. These posts were used in order to refine the coding process and to make sure each coder used the same systematic process for coding each post receiving votes. I then randomly selected 100 posts receiving votes to be analyzed and coded by all three coders independently. These 100 posts were used to calculate Cohen’s Kappa (simple) and Krippendorff’s Alpha in order to access the reliability of the process. The inter-rater reliability results are shown in Table 16 for these three variables. Discrepancies between the three coders were resolved using a simple majority for these 100 posts. I finally randomly assigned the remaining posts receiving votes to each of the three coders. In the final coded data set, there were 64 posts receiving votes coded as violating a group bond, 60 posts receiving votes coded as violating a group boundary, and 101 posts receiving votes coded as violating a speech norm.
### Table 16. Reliability Statistics for Coded Variables

<table>
<thead>
<tr>
<th></th>
<th>COHENS KAPPA (SIMPLE)</th>
<th>Krippendorff’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coder 1 &amp; Coder 2</td>
<td>Coder 1 &amp; Coder 3</td>
</tr>
<tr>
<td>Group Bond Violations (n=100)</td>
<td>0.78</td>
<td>0.84</td>
</tr>
<tr>
<td>Language Norm Violations (n=100)</td>
<td>0.90</td>
<td>0.91</td>
</tr>
<tr>
<td>Group Boundary Violations (n=100)</td>
<td>0.94</td>
<td>0.81</td>
</tr>
<tr>
<td>Habitus (n=50)</td>
<td>0.87</td>
<td>0.91</td>
</tr>
<tr>
<td>Positive Post Control (n=100)</td>
<td>0.81</td>
<td>0.89</td>
</tr>
<tr>
<td>Negative Post Control (n=100)</td>
<td>0.88</td>
<td>0.74</td>
</tr>
</tbody>
</table>

### Field

My study operationally defines Bourdieu’s conceptualization of the field as the entire TPC site. This field contains many spaces of interaction (Java forums, C# .NET forums, off-topic forums, the TPC Cubicle, and so on), which may each have different group styles and tacit rules of the game but the class structure is determined across the entire site. For example, what is acceptable conduct in the off-topic forums may not be acceptable conduct in the TPC Cubicle (forum group style), but a member’s social class as determined by his/her score in the peer-to-peer feedback system is related to posting activity across the entire field/site. Within this field, the stakes of the game are related to the accumulation of high scores (votes) within the peer-to-peer feedback system. TPC can be a highly competitive space where members are competing for votes (i.e. high scores in the peer-to-peer feedback system) and members often get deeply agitated when they are negatively voted, which results in a reduction in their score. On the surface, the barrier to entry into this field is quite low, because all an individual has to do is create a profile in order to join this field. However, the TPC field is situated in the occupational culture (Trice, 1993) of programming. Therefore, the barrier to entry into this field is the skill-
based craft of software development (in addition to the creation of a profile), which increases the barrier to entry significantly.

**Habitus Differences**

Before determining the differences in habitus between the giver and the receiver of feedback, I first had to determine each member’s habitus as it relates to the TPC field and the occupational culture of programming. An individual’s programming habitus is an abstract concept that is difficult to measure, because habitus is acquired through socialization processes and each individual is socialized differently. There are probably no two people who have the exact same habitus, because no two people have identical experiences and those experiences are embodied in their habitus (Bourdieu & Wacquant, 1992; Emirbayer & Johnson, 2008). However, previous literature often proxies domain-specific habitus based on where an individual is educated or other similar external trajectories (Bourdieu, 2005; Mutch, 2003). My study follows those previous studies by using a multi-dimensional proxy (Petter, Straub, & Rai, 2007) for an individual’s programming habitus based on external trajectories related to the occupational culture of programming.

The external trajectories used to proxy for an individual’s programming habitus include the following: (1) the programming paradigm a particular programmer subscribes to, (2) the programmer’s dominant software ideology, (3) the programmer’s national culture, and (4) the programmer’s primary programming language. These four dimensions of an individual’s programming habitus are rooted in the idea that programmers acquire taken-for-granted understandings that inform their practical actions through more than just one element (Emirbayer & Johnson, 2008). It is a combination of factors that comprise an individual’s classificatory structures, behavioral tendencies, and general dispositions towards solving problems
programmatically. Figure 5 shows the literature used to justify each dimension used in my operational definition of habitus. Table 17 provides more details concerning the operational definition of each dimension and each part of the definition is discussed in detail in the following pages.

![Diagram showing the operationalization of programming habitus](image)

**Figure 5. Operationalization of Programming Habitus for a Given Developer**
**Table 17. Sample of values for each dimension in my multi-dimensional proxy for habitus**

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>SAMPLE OF POSSIBLE VALUES</th>
<th>CODING DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Paradigm</td>
<td>Imperative, Object-Oriented, Functional, Multi-Paradigm</td>
<td>A combination of the ‘about me’ field (free form text entered by the member) and the programming language field in each member’s personal profile. If these two fields did not have enough information to code the programming paradigm, I then looked for posted tutorials, code snippets and the programming forums where the member spent most of his/her time.</td>
</tr>
<tr>
<td>Ideology</td>
<td>Microsoft, Linux, Mac, Ideology Neutral</td>
<td>Operating system preference field in the member’s personal profile</td>
</tr>
<tr>
<td>National Culture</td>
<td>US, Canada, Great Britain, India, New Zealand, and so on</td>
<td>The country field in the member’s personal profile</td>
</tr>
<tr>
<td>Programming Languages</td>
<td>Java, C#, C++, C, Objective-C, VB .NET, VB 6.0, Perl, and so on</td>
<td>Which forum the member spent most of his/her time based on posts displayed in the ‘View Posts’ link off of each member’s personal profile page.</td>
</tr>
</tbody>
</table>

Any combination of the four dimensions is the proxy for a programmer’s habitus. For example:

*An imperative* developer subscribing to the *Microsoft* ideology with cultural origins from *India* whose primary language is *VB .NET*

*A multi-paradigm* developer subscribing to the *Linux* ideology with cultural origins from the *US* whose primary language is *Java*

*An object-oriented* developer subscribing to the *Microsoft* ideology with cultural origins from *New Zealand* whose primary language is *C#*
Programming Paradigm

The first element in this operational definition is the programming paradigm to which a programmer subscribes. A programming paradigm offers “linguistic abstractions and proof theories for expressing program implementations” (Spinellis, Drossopoulou, & Eisenbach, 1994, p. 191). Examples of programming paradigms include functional (primarily concerned with functionality and not with memory-related variable storage and assignment sequences), imperative (primarily concerned with procedures and sequential flow of statements), object-oriented (shifts the focus from code to data through the modeling of real-world objects), logic (primarily concerned with declarations and not programmatic sequences), and concurrency (primarily concerned with logically simultaneous processing). Each programming paradigm differs in their underlying assumptions to varying degrees (Spinellis, et al., 1994). For example, a functional developer writes applications using stateless (no storage of information) mathematical functions through the use of conditional expressions and recursion in order to effect computation, while an imperative developer writes applications using procedures whereby the flow of execution is modified through the use of conditional and looping statements. Therefore, developers who subscribe to one paradigm relative to another have different ways of conceptualizing problems and the underlying programmatic solutions to those problems, which is consistent with the classification portion of the habitus definition (Bourdieu & Wacquant, 1992). There are also multi-paradigm developers who use a combination of these paradigms, and many modern programming languages provide support for multiple paradigms (Spinellis, et al., 1994).

In order to determine the programming paradigm for a given developer, three coders (myself included) coded the personal profiles of the 233 developers who are in my sample of votes. We

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first coded 25 member profiles together in order to refine the process and to determine which fields in the member’s personal profile were the most relevant in determining the programming paradigm. The general progression of fields used to code each member’s programming paradigm was as follows: (1) the ‘About me’ field (free form text field), (2) the programming language field (free form text field where the member lists programming languages), and (3) posting activity within the eNoP (tutorials, code snippets and programming forum activity). I then randomly selected 50 member profiles that each coder coded independently in order to statistically determine the reliability of the process. Table 16 shows the Cohen’s Kappa (simple) and Krippendorff’s Alpha statistics for the habitus variable. Discrepancies on these 50 data points were resolved using a simple majority. There was not a situation where all three coders had unique paradigms coded. The remaining profiles were randomly assigned to each coder.

**Ideology**

Ideology links habitus to social norms and the quest for ideological legitimation by classes or positions within a field (Bourdieu & Wacquant, 1992). Within the programming occupational culture, Raymond (1999) demonstrates that software developers who are socialized using the commercial approach (i.e. centralized development, proprietary software, infrequent software releases) are expected to acquire a different set of dispositions and taken-for-granted assumptions relative to software developers who are socialized using the open source approach (i.e. decentralized development, open software, frequent software releases). The commercial approach is often linked with Microsoft’s ideology, and the open source approach is often linked with Linux’s ideology. Stewart and Gosain (2006) further demonstrate that ideology differences between open source developers impact team effectiveness, because, in part, ideology dimensions provide a general toolkit which individuals and teams leverage in order to achieve
their objectives. This general toolkit or cultural repertoire is an important component of habitus, because the toolkit may create practices of value and expectations about the roles they could possibly enact within a given eNoP, which may differ along ideological lines (Bourdieu & Wacquant, 1992; Emirbayer & Johnson, 2008).

In my study, an individual’s dominant ideology was determined by the operating system preference field in each member’s personal profile. This field was chosen for two main reasons. First, developers who take the time to list an operating system preference subscribe, on at least some level, to the set of principles governed by the company that developed the operating system. For example, it is my contention that developers who take the time to list Windows as their operating system of preference subscribe, in part, to the Microsoft set of software development principles. Also, in this case socialization is socializing with the inner workings of the machine in addition to the other developers working on the same platform. For example, every time a Windows developer logs in and works in that environment, he/she is being socialized in Microsoft’s computing ideology. Second, the operating system preference field is visible when logged in members are reading discussion threads and posts by individual members. This is important because an icon depicting the operating system preference field is visible whenever a member is voting on a post, which means similarities and differences in ideology may be evident when members vote on posts.

**National Culture**

I also expect an individual’s programming habitus to be different across national cultures, because, for instance, the systems of thought or information processing styles differ across cultural boundaries (Nisbett, Peng, Choi, & Norenzayan, 2001). Nisbett and colleagues (2001)

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19 Many developers (33 out of the 233 members) in my sample do not list an operating system preference, so those developers are coded as ideology neutral, meaning they have no ideological preference.
categorized information processing differences as either holistic or analytic. Holistic information processing refers to “an orientation to the context or field as a whole, including attention to relationships between a focal object and the field, and a preference for explaining and predicting events on the basis of such relationships” (Nisbett, et al., 2001, p. 293). Analytic information processing refers to the “detachment of the object from its context, a tendency to focus on attributes of the object to assign it to categories, and a preference for using rules about the categories to explain and predict the objects behavior” (Nisbett, et al., 2001, p. 293). This idea is related to habitus, because an individual’s system of thought provides a mechanism which may generate and organize practices and representations. Those representations associated with habitus are often unconsciously acquired through socialization within an environment, such as a national culture, and are highly resistant to change (Mutch, 2003).

The country of origin field is used to proxy for the national culture component of my programming habitus operational definition. This field, just like the operating system preference field, is visible when members read threads, so voters can visibly see the country of origin when making voting decisions without having to navigate to each member’s personal profile page. My study is not attempting to determine degree of national cultural differences (i.e. the difference between a Chinese developer and an American developer is, say, five times greater than the difference between a Canadian developer and an American developer). Instead, I am using the national culture field to determine differences in a binary manner (i.e. difference between Chinese and US is 1, difference between Canadian and US is 1, difference between Chinese and Chinese is 0, and so on).
**Primary Programming Language**

Although programming languages are often linked with specific programming paradigms, there is not necessarily a perfect fit between programming languages and paradigms as each language has its own nuances and implementations of certain paradigmatic features (Van Roy & Haridi, 2004). For example, constructors (subroutines called when objects get created) written in Java are similar to but not identical to constructors written in, say, C++ or C# even though they are all object-oriented programming languages. Therefore, to account for idiosyncratic differences between programming languages within a given programming paradigm, the final component in my operational definition of habitus is the primary programming language that a particular developer utilizes. The primary programming language was determined by viewing the programming related posts including tutorials, code snippets and programming blog entries made by a particular member. This activity is visible through a link on each member’s profile page. The programming forum where a developer had the majority of his/her posts is considered to be that developer’s primary programming language.

**Multi-Dimensional Habitus Descriptive Statistics**

Of the 233 members in my sample, there were 114 unique combinations of the four dimensions used in my operational definition of habitus. There were 155 developers coded as objected-oriented, 44 as imperative and 34 as multi-paradigm. In terms of ideology, 133 developers identified with the Microsoft ideology, 52 identified with the Linux ideology, 33 had no ideology preference and 15 identified with the Macintosh ideology. There were 32 different countries represented in my sample, but most of the developers were from the US (134) and Great Britain (34). There were eight different programming languages that were identified as the
dominant language (C (88), Java (57), C# (41), PHP (23), VB .NET (15), VB 6.0 (5), Python (3), and Functional (1)).

**Habitus Difference Formula**

After each developer’s habitus was manually coded, the giver of feedback and the receiver of feedback were compared on each dimension for each vote. A habitus difference score of four means that the two developers had differences on all four dimensions, and a habitus difference score of zero means that the two developers were the same on all four dimensions. The formula to count the differences along each dimension is as follows:

\[
iif((\text{Programming Paradigm})_j = (\text{Programming Paradigm})_k, 0, 1) + iif((\text{Ideology})_j = (\text{Ideology})_k, 0, 1) + iif((\text{National Culture})_j = (\text{National Culture})_k, 0, 1) + iif((\text{Programming Languages})_j = (\text{Programming Languages})_k, 0, 1)
\]

where \(j\) is the giver of feedback and \(k\) is the receiver of feedback.

If one of the developers in an interaction had his/her programming paradigm coded as multi-paradigm, then I assume that there is no difference on the paradigm dimension. The same logic holds for the ideology and national culture dimensions if one of the developers was coded as ideology neutral or did not specify a value in the country field in his/her profile.

**Symbolic Capital**

Symbolic capital was determined using a two part process. First, I calculated each member’s score in the peer-to-peer feedback system as of 4/15/2011 using TPC’s score keeping formula. At TPC, a member’s score at a given point in time is determined by adding the total positive votes that a member received and subtracting the total number of negative votes a member received. 4/15/2011 is the midpoint in my voting observation period within the TPC Cubicle. Second, I determined the social class that a specific score equated to in the system. At TPC, the
peer-to-peer feedback system clusters members with similar scores together. For example, members who have a score between five (inclusive) and ten (not inclusive) in the system are labeled as ‘workers.’ Table 18 shows the social classes and their associated numerical values. The class number, instead of the absolute score, was used in the data analysis in order to categorize the amount of symbolic capital that a giver and a receiver of feedback had (as of 4/15/2011). This is modeled as a continuous variable in the data analysis.

Table 18. Symbolic Capital Groups Based on Number of Votes

<table>
<thead>
<tr>
<th>CLASS NUMBER</th>
<th>CLASS NAME</th>
<th>SCORE GREATER THAN OR EQUAL TO</th>
<th>SCORE LESS THAN</th>
<th>NUMBER OF MEMBERS IN MY SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Exiled</td>
<td>-5000</td>
<td>-20</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Disgraced</td>
<td>-20</td>
<td>-10</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Shunned</td>
<td>-10</td>
<td>-5</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Dishonored</td>
<td>-5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Apprentice</td>
<td>0</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>Worker</td>
<td>5</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>Tradesman</td>
<td>10</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>8</td>
<td>Craftsman</td>
<td>25</td>
<td>50</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>Whiz</td>
<td>50</td>
<td>100</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td>Stalwart</td>
<td>100</td>
<td>250</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>Architect</td>
<td>250</td>
<td>500</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>Enlightened</td>
<td>500</td>
<td>750</td>
<td>8</td>
</tr>
<tr>
<td>13</td>
<td>Master</td>
<td>750</td>
<td>1000</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Grandmaster</td>
<td>1000</td>
<td>2500</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>Guru</td>
<td>2500</td>
<td>5000</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Overlord</td>
<td>5000</td>
<td>7500</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Deity</td>
<td>7500</td>
<td>10000</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Legendary</td>
<td>10000</td>
<td>10000000</td>
<td>0</td>
</tr>
</tbody>
</table>

Control Variables

There were four control variables used in this study in order to control for possible alternative explanations of voting practices (Previous Negative Vote, Previous Positive Vote,
Negative Quality Control, and Positive Quality Control). The previous negative vote and previous positive vote variables are necessary, because the playing field consists of accumulated histories of past actions and interactions (Bourdieu & Wacquant, 1992). The previous negative vote variable is designed to control for the variability in voting that may be attributable to a revenge factor. The giver of feedback (voter) may negatively vote another member simply because the receiver of feedback previously negatively voted the giver of feedback. This binary control variable is set to zero if there was not a previous negative voting history and a one if there was a previous negative voting history at the time of the interaction. The previous positive vote variable is essentially controlling for the opposite effect. This variable is controlling for the possibility that a previous positive voting relationship may reduce the likelihood that a giver of feedback will negatively vote a member who previously positively voted him/her. This is also a binary variable where a zero represents two dyadic pairs not having a previous positive voting history and a one represents having a previous positive voting history at the time of the interaction. In the final data set, there were 457 posts involving dyadic pairs of members who previously had a prior positive voting history in the peer-to-peer feedback system and 82 posts involving dyadic pairs of members who previously had a prior negative voting history in the peer-to-peer feedback system.

One of the reasons why eNoP and other electronic social structures have implemented peer-to-peer feedback systems is to determine contribution quality such that the membership gets socially stratified along dimensions of quality (Crowston, et al., 2012; Kollock & Smith, 1999; Preece & Schneiderman, 2009). My contention in this study is that a portion of the variability in voting behaviors may be attributable to factors other than the quality of the contribution. As such, it is essential to control for the quality of the post. To do this, I incorporated both a
negative quality control variable and a positive quality control variable. The negative control variable is designed to account for any voting variability that might reasonably be attributable to a low quality post. There were two main factors that resulted in a post being coded as a low quality post. First, posts with factual inaccuracies were considered of low quality. For example, a member posting that Microsoft released a product that it did not release would be considered factually inaccurate.

Second, posts that were “trolling” in nature were coded as low quality posts. Trolling in this case means that the post was written in order to anger or to illicit a response from the other participants in the thread. For example, in a thread discussing Apple releasing a new version of their iPhone where the participants were having a relatively innocuous discussion about the product, a member posting a response referring to Mac users as “Macinturds” or something equally unpleasant would be considered trolling behavior. Although the TPC Cubicle represents a forum where relatively serious discussions concerning IT related topics occur (see group bond column in Table 15), it is still an Internet forum, which means that it is not immune to general deviant or trolling behaviors. Therefore, it is not against the group bond for this particular forum to have threads where trolling happens. It is not frequent but it happens enough where it is not against the norm.

The positive quality control variable controls for the opposite effect. The positive control variable is designed to account for any voting variability that might reasonably be attributable to a high quality post. There were three primary factors that made a post a high quality post in the TPC Cubicle. First, posts that attempt to bring a thread back to its intended purpose were coded as high quality. For example, certain threads may start off discussing one topic and end up discussing a different topic. Often times when this happens, a member will have a post that
attempts to bring the discussion thread back onto its original purpose (without disrespecting any of the participants in the thread). Within this forum, members frequently commented about their appreciation for those types of posts. Second, posts that included well-articulated opinions, insights, and/or arguments were considered high quality. In the TPC Cubicle, the group bond (see group bond column in Table 15) is that members are expected to contribute insightful comments regarding a specific topic. However, certain posts may be more insightful than others within a thread, and those were coded as high quality. For example, in a discussion thread about whether .NET is a cross platform framework, a post articulating both sides of the argument when the other posts in the thread simply state an opinion would be considered high quality. Third, posts with well-timed humor were coded as high quality posts. The group bond within the TPC Cubicle is to keep the mood light but on topic. Posts that attempt to lighten the mood were considered high quality posts. These types of posts were evident in the more heated topics where the members had strong opinions (i.e. Microsoft’s mobile strategy relative to Apple or Google). Members often thanked other members for attempting to lighten the mood during the excessively serious discussion threads.

In order to reduce the subjectivity associated with these two quality control variables, I used three coders (myself included). I used the same process as I used to code the habitus of each member and the posts in relation to the group style. Three coders coded 73 posts together (same 73 as used in the group style coding process) in order to refine the process. The process involved reading the entire thread first, then reading all of the posts receiving positive or negative votes, and finally comparing the quality of the post being coded against those posts that received and did not receive positive or negative votes in that thread. As a group, we iterated through these 73 posts several times in order to refine the process. I then used the same randomly selected 100
posts used in the group style violation process to be coded by each coder independently. The results of this exercise (100 independently coded posts) were used to calculate the Cohen’s Kappa (simple) and Krippendorff’s Alpha in order to assess the reliability of the process. The inter-rater reliability statistics are shown in Table 16. Discrepancies between the three coders were resolved using a simple majority for these randomly selected 100 posts. I finally randomly assigned the remaining posts to each of the three coders. In the final data set, there were 18 posts coded as being of excessively poor quality and 631 posts coded as being excessively high quality.

Results

Single level regression models generally assume that the effect of regression coefficients is the same in all contexts. A multi-level regression model (or alternatively referred to as a hierarchical linear model (HLM)), on the other hand, does not have this assumption, which enables the ability to statistically tease out the effect of contextual factors. In my data, an individual voting interaction is embedded in the context of a post, the giver of feedback (voter) and the receiver of feedback (author of a post). I am trying to tease out the effect of voting behaviors attributable to properties of the post receiving the vote, properties of the giver of feedback, properties of the receiver of feedback, and properties of the combination of givers and receivers. There is no single unit of analysis associated with this problem and my research model requires testing interaction effects associated with different units of analysis (i.e. group style violations are properties of the post and habitus differences are properties of each combination of giver and receiver). Additionally, my data include multiple votes from the same giver of feedback, multiple votes given to the same receiver of feedback, and multiple votes on the same post. Therefore, the assumption of independence of residuals is violated making a
single level regression model further problematic. As such, an HLM regression is the most appropriate model given all of these complexities associated with my data and research hypotheses.

The dependent variable in these models is binary where a 0 represents a positive vote and a 1 represents a negative vote (116 negative votes and 1,190 positive votes). The actual event being modeled is the log odds of a negative vote (event=1), which is consistent with the direction of each one of my hypotheses. The following two-level HLM regression was used:

**Level-1:** \( \eta_{ijkl} = \text{logit}(Y_{ijkl}) \)

\[ \eta_{ijkl} = \pi_{0ijkl} \]

**Level-2:** \( \pi_{0ijkl} = \beta_{00} + \beta_{01}(\text{Habitus Difference})_{jk} + \beta_{02}(\text{Receiver Symbolic Capital})_j + \beta_{03}(\text{Giver Symbolic Capital})_k + \beta_{04}(\text{Prior Positive Vote})_{jk} + \beta_{05}(\text{Prior Negative Vote})_{jk} + \beta_{06}(\text{Group Bond Violation})_l + \beta_{07}(\text{Speech Norm Violation})_l + \beta_{08}(\text{Group Boundary Violation})_l + \beta_{09}(\text{Negative Quality Post})_l + \beta_{10}(\text{Positive Quality Control})_l + \mu_{0j} + \mu_{0k} + \mu_{0l} \)

**Combined:** \( \eta_{ijkl} = \beta_{00} + \beta_{01}(\text{Habitus Difference})_{jk} + \beta_{02}(\text{Receiver Symbolic Capital})_j + \beta_{03}(\text{Giver Symbolic Capital})_k + \beta_{04}(\text{Prior Positive Vote})_{jk} + \beta_{05}(\text{Prior Negative Vote})_{jk} + \beta_{06}(\text{Group Bond Violation})_l + \beta_{07}(\text{Speech Norm Violation})_l + \beta_{08}(\text{Group Boundary Violation})_l + \beta_{09}(\text{Negative Quality Post})_l + \beta_{10}(\text{Positive Quality Control})_l + \mu_{0j} + \mu_{0k} + \mu_{0l} \)

where i is the vote, j is the receiver of feedback, k is the giver of feedback (voter), and l is post.

The level-1 unit of analysis is the vote and the level-2 units of analysis are the giver of feedback, the receiver of feedback, and the post. Each interaction effect of group style violations and habitus differences were tested separately, so an additional level-2 interaction term was included in those models.

---

20 Two three-level HLMs were considered as well. First, I tried to fit a model with the vote at level-1, the post at level-2, and the giver and receiver at level-3. An unconstrained model with this nesting structure indicated that there was not any statistically significant random variation at level-3. Second, I tried to fit a model with the vote at level-1, the post, the giver, and the receiver at level-2, and the social class of the giver and receiver (i.e. guru, apprentice, master, and so on) at level-3. An unconstrained model with this nesting structure indicated that there was not any statistically significant random variation attributable to the social class of the giver and the social class of the receiver. Therefore, I utilized a more parsimonious two-level nesting structure, modeling the fixed effect of class structure as properties of the individual givers and receivers at level-2 along with properties of the post at level-2.
The primary assumption with these models is that all votes are considered to be independent after controlling for the variance/covariance of votes associated with having multiple votes on a single post, which is controlled for by including the $\mu_{0l}$ level-2 random effect in each model. This means the following: (1) a given vote is not influenced by previous interactions between the giver and the receiver and (2) there is no herding effect associated with voting practices. The assumption that a given vote is independent of previous interaction patterns is plausible given the two interaction history control variables used in the full HLM models. These two control variables should capture any variability associated with previous interaction histories. There also does not appear to be any evidence of a herding effect in voting behaviors where members may have an increased likelihood of voting a given post negatively or positively based on other member’s previous positive or negative votes within a given post. If herding behavior exists, I should see an increase in the number of votes (positive or negative) in the periods immediately following a large amount of voting activity. For example, if there are a lot of votes in period 1 on a given post, then I would expect more votes in period 2 for those posts due to a herding effect. I do not see this effect in my data. Roughly 80% of all positive votes occur in the first period (on the same day as the first vote) and 77% of all negative votes occur in the initial period. 21 There is a dramatic decline in voting activity after the initial voting period for both the positive and negative votes, regardless of whether there is a lot of voting activity in the initial period or not.

This model falls into the category of a generalized linear mixed model using the logit link function in order to convert the binary outcome variable into a continuous (unbounded) outcome

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21 In my data, I have daily voting data (i.e. vote occurred on 3/15/2011 or 4/3/2011), but I do not have the exact time on a given day when a vote occurred. Therefore, I can only assess herding activity on a daily basis (i.e. day one to day 2 to day 3 and so on). A more precise check for herding behavior would have time periods determined in seconds, minutes or hours. These data are not available.
variable. Therefore, the model is linear with respect to the logit transformation but is non-linear with respect to the probability. This model also does not require the level-1 residuals to be normally distributed and the level-1 residual variance is not estimated. The level-1 residual variance is considered to be constant at \((\pi^2)/3\). The level-2 random effects are assumed to have a multivariate normal distribution for each level-2 factor (i.e. giver random effects, receiver random effects, and post random effects). This assumption was tested in my data using the Shapiro-Wilk test, because there was only a single random effect for each level-2 factor in all models. Results from these tests do reveal statistically significant deviations from normality for the giver random effects, the receiver random effects and the post random effects, but all kurtosis values were between 0.57 and 9.32 while all skewness values were between -2.90 and -1.17. Kline (2011) argues that tests for normality may be overly sensitive with larger sample sizes, which may lead to trivial departures from normality to be statistically significant. Kline (2011) argues that standardized skew index values between -3.0 and +3.0 and standardized kurtosis index values of -10 and 10 may be considered roughly normal.

Each model was run using a residual pseudo-likelihood (RSPL) estimation technique with a subject-specific expansion locus (vector of random effects solutions) in order to reduce the bias associated with determining fixed-effect estimates using maximum likelihood estimates. This technique assumes that the level-1 residuals are independent after controlling for the level-2 random effects (i.e. each vote is independent, meaning the probability of two observations is just the probability of each multiplied together) and the level-2 units are independent (i.e. there is no additional nesting required beyond the giver, receiver, and post). In order to determine if a level-3 nesting structure was required, I tried fitting a model with a third level of nesting related to the social class of the giver and the social class of the receiver of feedback. An unconstrained model
with this nesting structure indicated that there was not any statistically significant random variation attributable to the social class of the giver and the social class of the receiver. Therefore, I assume that the level-2 units as I have them modeled are independent. As such, I modeled the fixed effect of class structure as properties of the individual givers and receivers at level-2.

All models used a different variance component for each random effect (vc). The denominator degrees of freedom option used in all models was between-within (bw), which splits the residual degrees of freedom into between-subject and within-subject portions. Finally, the iterative Newton-Raphson optimization technique was used in order to converge each model to a solution. This technique provides standard errors based on observed information as opposed to expected information and uses the shape of the likelihood function to find parameter values closer to the maximum.

Table 19 shows the descriptive statistics and the correlation matrix for the independent variables used in these models. The prior positive vote control variable and the giver symbolic capital variable had the highest correlation of 0.5, which is considered high based on Cohen’s (1988) guidelines. All other statistically significant correlations were below 0.3, which is generally considered only a moderate or a low level of correlation (J. Cohen, 1988). Multi-collinearity between the independent variables was assessed using the variance inflation factors (VIF) (also displayed in Table 19). All variance inflation factors were between 1.01 and 1.56, which are substantially lower than the common cutoffs of 4 or 10 (O'Brien, 2007). Therefore, multi-collinearity was not an issue with these ten independent variables.
Table 19. Descriptive Statistics and Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>VIF</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Habitus Differences Scale = 0 to 4</td>
<td>1.81</td>
<td>0.90</td>
<td>1.03</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Group Bond Violation (Binary)</td>
<td>0.05</td>
<td>0.22</td>
<td>1.07</td>
<td>0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Speech Norm Violation (Binary)</td>
<td>0.08</td>
<td>0.27</td>
<td>1.01</td>
<td>0.02</td>
<td>0.04</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Group Boundary Violation (Binary)</td>
<td>0.05</td>
<td>0.21</td>
<td>1.05</td>
<td>0.04</td>
<td>-0.05*</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Receiver Symbolic Capital Scale = 1 to 15</td>
<td>10.74</td>
<td>3.02</td>
<td>1.18</td>
<td>-0.10***</td>
<td>-0.10***</td>
<td>-0.05*</td>
<td>-0.09***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Giver Symbolic Capital Scale = 1 to 15</td>
<td>9.31</td>
<td>3.07</td>
<td>1.40</td>
<td>-0.05*</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.06**</td>
<td>-0.01</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Prior Negative Vote (Binary)</td>
<td>0.06</td>
<td>0.24</td>
<td>1.03</td>
<td>-0.03</td>
<td>0.09***</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.08***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Prior Positive Vote (Binary)</td>
<td>0.35</td>
<td>0.48</td>
<td>1.56</td>
<td>-0.1***</td>
<td>0.03</td>
<td>0.01</td>
<td>0.00</td>
<td>0.29***</td>
<td>0.50***</td>
<td>0.13***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Positive Quality Post (Binary)</td>
<td>0.48</td>
<td>0.50</td>
<td>1.07</td>
<td>0.06**</td>
<td>-0.17***</td>
<td>-0.03</td>
<td>-0.12***</td>
<td>0.10***</td>
<td>0.04</td>
<td>-0.05*</td>
<td>-0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>10</td>
<td>Negative Quality Post (Binary)</td>
<td>0.01</td>
<td>0.12</td>
<td>1.05</td>
<td>0.03</td>
<td>0.13***</td>
<td>-0.06**</td>
<td>0.13***</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.00</td>
<td>-0.11***</td>
</tr>
</tbody>
</table>

* Significant at 0.1, ** Significant at 0.05, *** Significant at 0.01
Table 20 shows the solution for fixed effects, random effects, and model fit statistics for the HLM regressions used to test my five hypotheses. The unconstrained model (Model 1) was used to determine the applicability of the two-level nesting structure. Due to the binary nature of my outcome variable, I followed the advice of Snijders and Bosker (2012) in order to calculate a pseudo intra-class correlation coefficient (ICC) (effect of nesting on model variance). They suggest estimating the variance of the logistic function using \((\pi^2)/3\), which is roughly 3.29, and then using the squared covariance parameter estimates in order to estimate the ICC. Using this method with the unconstrained model covariance estimates, the receiver nesting has an ICC of roughly 55%, the giver nesting has an ICC of roughly 2.5%, and the post nesting has an ICC of approximately 9%. The giver and receiver covariance parameter estimates in the unconstrained model are highly significant while the post covariance parameter estimate is significant at the 0.1 level. The high ICC for the receiver provides some rudimentary support for the idea that eNoP members are voting characteristics of other members and not just characteristics of the post. The ICC for the giver of feedback is low, but still highly significant, so some characteristics of the giver are valid predictors of the log odds of a negative voting interaction in the peer-to-peer feedback system.
Table 20. HLM Fixed Effects, Random Effects and Model Fit Statistics

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Estimate</th>
<th>Odds</th>
<th>Estimate</th>
<th>Odds</th>
<th>Estimate</th>
<th>Odds</th>
<th>Estimate</th>
<th>Odds</th>
<th>Estimate</th>
<th>Odds</th>
<th>Estimate</th>
<th>Odds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-2.74***</td>
<td>0.06</td>
<td>-0.14</td>
<td>0.87</td>
<td>-0.36</td>
<td>0.70</td>
<td>-0.99</td>
<td>0.37</td>
<td>-0.47</td>
<td>0.62</td>
<td>-0.41</td>
<td>0.66</td>
</tr>
<tr>
<td>Habitus Differences</td>
<td>0.36*</td>
<td>1.43</td>
<td>0.46**</td>
<td>1.58</td>
<td>0.74***</td>
<td>Interaction See Figure 6</td>
<td>0.51**</td>
<td>Interaction Not Reported</td>
<td>0.48**</td>
<td>Interaction Not Reported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Bond Violation</td>
<td>3.03***</td>
<td>20.75</td>
<td>3.02***</td>
<td>20.47</td>
<td>5.73***</td>
<td>Interaction See Figure 6</td>
<td>3.02***</td>
<td>20.58</td>
<td>3.02***</td>
<td>20.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech Norm Violation</td>
<td>1.96***</td>
<td>7.10</td>
<td>2.04***</td>
<td>7.69</td>
<td>2.10***</td>
<td>8.20</td>
<td>2.58***</td>
<td>Interaction Not Reported</td>
<td>2.04***</td>
<td>7.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Boundary Violation</td>
<td>2.54***</td>
<td>12.65</td>
<td>2.75***</td>
<td>15.66</td>
<td>2.80***</td>
<td>16.42</td>
<td>2.77***</td>
<td>16.00</td>
<td>3.08***</td>
<td>Interaction Not Reported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiver Symbolic Capital</td>
<td>-0.27***</td>
<td>0.77</td>
<td>-0.23***</td>
<td>0.79</td>
<td>-0.23***</td>
<td>0.79</td>
<td>-0.23***</td>
<td>0.79</td>
<td>-0.23***</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giver Symbolic Capital</td>
<td>-0.19***</td>
<td>0.83</td>
<td>-0.16**</td>
<td>0.85</td>
<td>-0.16**</td>
<td>0.85</td>
<td>-0.16**</td>
<td>0.85</td>
<td>-0.16**</td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitus Differences * Group Bond Violation</td>
<td>-1.39***</td>
<td>Interaction See Figure 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitus Differences * Speech Norm Violation</td>
<td>-0.27</td>
<td>Interaction Not Reported</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitus Differences * Group Boundary Violation</td>
<td>-0.17</td>
<td>Interaction Not Reported</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Negative Vote</td>
<td>1.25**</td>
<td>3.50</td>
<td>1.24**</td>
<td>3.46</td>
<td>1.24**</td>
<td>3.46</td>
<td>1.26**</td>
<td>3.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Positive Vote</td>
<td>-0.51</td>
<td>0.60</td>
<td>-0.57</td>
<td>0.56</td>
<td>-0.51</td>
<td>0.60</td>
<td>-0.51</td>
<td>0.60</td>
<td>-0.49</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Quality Post</td>
<td>-1.80***</td>
<td>0.16</td>
<td>-1.87***</td>
<td>0.15</td>
<td>-1.80***</td>
<td>0.17</td>
<td>-1.80***</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Quality Post</td>
<td>-2.46**</td>
<td>0.09</td>
<td>-2.26**</td>
<td>0.10</td>
<td>-2.46**</td>
<td>0.09</td>
<td>-2.47**</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random Effects</td>
<td>-2.33***</td>
<td>1.22**</td>
<td>1.42**</td>
<td>1.46**</td>
<td>1.40**</td>
<td>1.43**</td>
<td>0.51***</td>
<td>0.88**</td>
<td>0.86**</td>
<td>0.79*</td>
<td>0.85**</td>
<td>0.86**</td>
</tr>
<tr>
<td>Intercept (Receiver)</td>
<td>0.95*</td>
<td>0.76*</td>
<td>0.24</td>
<td>0.33</td>
<td>0.25</td>
<td>0.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept (Giver)</td>
<td>-2.46**</td>
<td>0.09</td>
<td>-2.26**</td>
<td>0.10</td>
<td>-2.46**</td>
<td>0.09</td>
<td>-2.47**</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Fit</td>
<td>Residual Log Pseudo-Likelihood</td>
<td>7,271.40</td>
<td>8,048.03</td>
<td>8,583.78</td>
<td>8,776.19</td>
<td>8,597.84</td>
<td>8,593.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 0.1, ** Significant at 0.05, *** Significant at 0.01
The main effect of habitus differences on the propensity to give and receive a negative vote (H1) is supported in Models 2 through 6, albeit in Model 2 it is only significant at the 0.1 level. When adding in the full complement of control variables without any interaction effects (Model 3), the effect of habitus differences on the odds of giving and receiving a negative vote is 1.58, which is significant at the 0.05 level. This means that increasing the habitus difference between the giver and the receiver along a single dimension, increases the probability of a negative vote in the peer-to-peer feedback system by roughly 61%. Model 3 is also a better fit than Model 2 (Residual Log Pseudo-Likelihood of 8,584 in Model 3 versus 8,048 in Model 2). Therefore, there is evidence that professional habitus differences between dyadic pairs of members do positively impact the log odds of giving and receiving a negative vote in the peer-to-peer feedback system.

The main effect of all of the group style violation variables (H2a, H2b, H2c) on the log odds of giving and receiving a negative vote in the peer-to-peer feedback system is supported in both main effect only models (Models 2 and 3) as well as in all models containing a group style interaction effect (Models 4 through 6). Members who write posts that violate the group style have a very high probability of having those posts negatively voted by their fellow members. The strongest effect is related to group bond violations. In Model 3, for instance, a post that violates the group bonds increases the odds of giving and receiving a negative vote by 20.47, while controlling for the effect of the other nine covariates. The main effect of group boundary violations on the log odds of giving and receiving a negative vote is stronger than the effect of speech norm violations, but both are highly significant with meaningful effect sizes in Models 2 and 3. Therefore, there is strong support for H2a, H2b and H2c in all models, specifically the main effect only models with and without the control variables (Models 2 and 3).
The interaction of group style violations and habitus differences is only significant for group bond violations (H3a) (Model 4) and not for speech norm violations (H3b) (Model 5) and group boundary violations (H3c) (Model 6). Figure 6 shows the differential impact that group bond violations have on habitus differences in terms of predicting the log odds of a negative vote based on the results reported in Model 4. The log odds of receiving a negative vote due to small professional habitus differences (difference along only any single dimension) will be amplified by 4.34 (76.80 increase in odds) in the presence of a group bond violation, after controlling for the effect of the other covariates in Model 4. When a member violates any element of the group bonds, it amplifies the impact of small professional habitus differences between dyadic pairs of members on the probability of a negative vote within the system. The log odds of receiving a negative vote due to large professional habitus differences (difference along all four dimensions) will be increased by only 0.18 (1.20 increase in odds) in the presence of a group bond violation, after controlling for the effect of the other covariates in Model 4. This means that large professional habitus differences between dyadic pairs of members will have roughly the same impact on the log odds of receiving a negative vote with or without a post violating the group bonds. The model with the group bond violation and habitus difference interaction effect (Model 4) is a better fit than the model without the interaction effect term (Model 3) based on the Residual Log Pseudo-Likelihood measure of model fit (8,776 in Model 4 versus 8,584 in Model 3). Therefore, there is strong support for H3a in these data.
There is evidence that members who have a large amount of symbolic capital based on their scores in the peer-to-peer feedback system have a decreased likelihood of receiving negative votes (H4). In Model 2, for instance, the log odds of a post authored by a member with minimal symbolic capital (say a member of the Apprentice social class) in the peer-to-peer feedback system receiving a negative vote is -1.35 (-0.27*5), which means the probability of an Apprentice receiving a negative vote is roughly 21%. This probability increases to 24% when the full complement of control variables are added (Model 3). The log odds of a post authored by a member with substantial symbolic capital (say a member of the Master social class) in the peer-to-peer feedback system receiving a negative vote is -3.51 (-0.27*13), which means the probability of
a Master receiving a negative vote is only 3%. This probability increases to almost 5% when the full complement of control variables are added (Model 3). Therefore, there is support for H4 in these data.

It could be, however, that this negative correlation is happening, because members with a greater amount of symbolic capital in the peer-to-peer feedback system are producing a greater number of higher quality posts and/or fewer posts of excessively low quality. The simple correlation matrix in Table 19 shows that there is not a correlation between the receiver of feedback’s symbolic capital in the peer-to-peer feedback system and posts that have been coded as excessively negative in quality. This means that members of all social classes (from Exiled to Guru) within this eNoP have an equal likelihood of authoring posts that are of excessively negative quality. I additionally tested a cross-level interaction effect of the negative post control variable and the receiver of feedback’s symbolic capital (not shown in Table 20), and that term was not significant. This means that posts of excessively poor quality are treated equally whether they are authored by high class members of the eNoP such as Masters or Gurus or low class members of the eNoP such as Apprentices or Workers.

Table 19 does show, however, that there is a correlation between posts coded as excessively high in quality and the receiver of feedback’s amount of symbolic capital, but the effect size of the correlation is quite low (0.1). This means that the high class members of this eNoP have a higher likelihood of authoring high quality posts relative to low class members of this eNoP. However, I tested a cross-level interaction effect of the positive post control variable and the receiver of feedback’s symbolic capital (not shown in Table 20), and the interaction term was not significant. This means that at the TPC Cubicle members are rewarding quality posts with a reduction in the log odds of receiving a negative vote in a consistent manner for all social classes of members.
(from Exiled to Guru). In other words, the impact of an Apprentice being rewarded for a quality post is not statistically different from the impact of a Master being rewarded for a quality post. Therefore, the quality of the contribution does not explain the main effect of the amount of symbolic capital the receiver has accumulated on the reduction in the log odds of receiving a negative vote found in Models 2 and 3.

There is evidence that the amount of symbolic capital that the giver of feedback (voter) has in the peer-to-peer feedback system is negatively correlated with the log odds of giving a negative vote (H5). In Models 2 through 6, increasing the amount of symbolic capital of the voter (giver of feedback) by one unit (increase in social class from, say, Apprentice to Worker or from Enlightened to Master) decreases the log odds of giving a negative vote by between 0.16 and 0.19.

In the full model with all of the control variables (Model 3), for instance, the log odds of a member with minimal symbolic capital (say an Apprentice) in the peer-to-peer feedback system giving a negative vote is -0.8 (-0.16*5), which means the probability of an Apprentice giving a negative vote is 31%. The log odds of a member with substantial symbolic capital (say a Master) in the peer-to-peer feedback system giving a negative vote is -2.08 (-0.16*13), which means the probability of a Master giving a negative vote is only 11%. The ICC for the giver of feedback was 2.5% based on the unconstrained model. Including the habitus difference variable and the giver of feedback’s symbolic capital variable (only variables that vary based on the giver of feedback in Model 2) in the model leaves only 12% of that 2.5% of the variance left unexplained. Therefore, H5 is supported in these data.

At the TPC Cubicle there is evidence of reciprocal positive and negative voting practices, but the impact of reciprocal negative voting practices was more robust than reciprocal positive voting practices. The prior negative vote control variable is significant in all models at the 0.05 level.
When the voter (giver of feedback) was previously negatively voted by the receiver of feedback, the log odds of a negative interaction increase by between 1.24 (odds of 3.46) and 1.26 (odds of 3.52) in all models. This strong and significant effect size suggests that these systems are being used to enact some form of revenge against prior negative votes. This is a problematic finding when negative votes are, at least theoretically, supposed to indicate that the member is not contributing quality content to the eNoP, but appears to be partially indicative of previous voting histories (accumulated histories of past interactions). This finding holds even when controlling for the quality of the post. The prior positive vote control variable was not significant in any of the reported models in Table 20. In a model with just the control variables (not displayed in Table 20), the positive vote control variable was significant and negative (reduction in log odds of a negative vote).

The negative quality post variable was highly significant in all models, but the sign is opposite from what would be logically expected. Posts that are coded as excessively negative have a reduced log odds of receiving a negative vote. This may be the case, because the manual coding effort only identified 18 excessively negative posts. Nevertheless, this result does provide further evidence that member’s scores in these systems may not be completely related to contribution quality. If, for example, posts of excessively poor quality do not have an increased probability of being negatively voted, then the integrity of member’s scores as a measure of a member’s worth to the eNoP is put into question. It is even more problematic if excessively poor contributions are being positively voted. However, the finding for posts coded as excessively positive is significant and in the expected direction for all models. In Model 3, for instance, the log odds of posts coded as excessively positive receiving a negative vote is -1.80 (odds of 0.16).
Discussion & Conclusions

Although results were mixed, early research on virtual communities, virtual teams and virtual groups demonstrated that, despite having minimal social and informational cues, electronic environments were still socially stratified (Ahuja & Carley, 1998; Crowston & Kammerer, 1998; Weisband, et al., 1995). A primary means of socially stratifying the membership is through the implementation of information rich peer-to-peer feedback systems whereby members are stratified into different social classes based on their scores within these systems. In theory, the social stratification based on data within these systems is expected to be based on the quality (or lack thereof) of contributions supplied by each member and not based on other social or cultural factors (Preece & Schneiderman, 2009). If this is the case, we should see fairly objective voting practices based on the quality of the contribution independent of the member receiving the vote and/or the giver of feedback (voter). My study, however, demonstrates empirically that member’s scores within these systems are, in part, based on occupational cultural similarities and differences between the giver and the receiver of feedback, previous interaction histories between dyadic pairs of members, adherence or a lack of adherence to the group style by the author of the post receiving feedback, the social class of the giver and receiver of feedback, and the quality of the contribution (on the positive side).

Theoretical Contributions

My study contributes to previous literature that argues that feedback systems may be used as platforms for status contests (Roberts, et al., 2006; D. Stewart, 2005) and ideological competitions (Barnett, et al., 2010). My empirical results demonstrate that an understanding of the culture of the enoP and broader occupational culture in terms of processes of meaning making and durable practices along with the group style of the particular discussion forum are important elements in
order to understand voting practices within these systems. I have argued in this study that a vote is a complex social and cultural phenomenon, and it is important to understand the social and cultural context before evaluating the impact that peer-to-peer feedback systems have on such factors like motivating future contributions and/or developing trust between members.

Within the information systems discipline more broadly, Bourdieu’s integrated social theory has been applied in a rather piecemeal manner, particularly omitting habitus from theoretical and empirical investigations. For example, Levina and Vaast (2008) use a rich discussion of different forms of capital in order to explain how those different forms of capital, both within and across fields, formed major obstacles in offshore collaboration in terms of creating status differences in the field. Their conceptualization of the field is extremely rich in terms of looking at how overlapping fields are constructed primarily in terms of different forms of capital, but they do not consider habitus, particularly as a generative structure in their analysis. Possibly, by considering habitus as an additional component, IS researchers may be able to extend and/or challenge the findings by Levina and Vaast (2008) and other IS scholars who have used only certain components of Bourdieu’s integrated social theory in their theoretical and empirical research.

Murray and colleagues (1995) warn researchers that they have to be careful about selectively picking and choosing (while discarding others) constructs when borrowing theories from other disciplines, because theories from all disciplines come with a set of values, interests and assumptions based on the context and the discipline which the theory was developed. This is particularly true with Bourdieu’s social theory. Over thirty years ago, DiMaggio (1979) warned that using Bourdieu without integrating habitus into the analysis is dangerous and possibly misleading, because habitus is a core element in his social theory serving as the link that mediates the relationship between structure and agency. More recently, Emirbayer and Johnson (2008) echo
that same word of caution. My study demonstrates that a full conceptualization of Bourdieu has tremendous value in order to explain problems related to the information systems discipline (particularly voting practices within peer-to-peer feedback systems), but discarding parts of his social theory may reduce the applicability of Bourdieu in explaining complex information systems related problems. In this manner, I contribute to information systems research particularly by Richardson (2003) and Schultze and Boland (2000a) who both use complete conceptualizations of Bourdieu in their studies of the use of customer relationship management software in call centers (Richardson, 2003) and the gatekeeping practices of competitive intelligence analysts (Schultze & Boland Jr., 2000a).

In an organizational context, Magee and Galinsky (2008) argue that more research is needed from diverse perspectives in order to understand the many forces involved in maintaining hierarchies as well as transforming them within organizational contexts. Although an eNoP is not a formal organization as defined by Magee and Galinsky (2008), many eNoP have fairly well established social hierarchies and understanding those hierarchies are important issues facing eNoP researchers. Many eNoP have been in existence for many years making it necessary to move beyond the emergent property set forth by McLure Wasko and Faraj (2005) in order to understand more mature eNoP. Bourdieu’s integrated social theory includes multiple dimensions, multiple levels of analysis and concepts of relationships specifically between positions in a field (Bourdieu & Wacquant, 1992; Emirbayer & Johnson, 2008). Therefore, it is a very useful theoretical lens to explain the forces involved in the production and the reproduction of the social hierarchy through voting practices within peer-to-peer feedback systems within eNoP.

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Practical Implications

In general, the design of peer-to-peer feedback systems within eNoP is relatively straightforward whereby any member may provide feedback on any other member typically in the form of positive and negative votes, and that feedback is immediately integrated into each member’s total score and visibly displayed for all to see. A primary design assumption associated with these systems is that more information and greater information transparency are better than less (Dellarocas, 2006). This, however, may not always be the case, because more information may increase competition among peers and also sharpen the status and class distinctions between community members (Lampel & Bhalla, 2007). This is particularly problematic, because social inequalities and competition among peers have been demonstrated to impede collaboration in a variety of contexts (Levina & Vaast, 2006; Metiu, 2006). Collaboration is a foundational concept in eNoP where the sites rely primarily on collaboration and the kindness of strangers in order to grow and prosper (Constant, et al., 1996; McLure Wasko & Faraj, 2005; Whelan, 2007). Of particular relevance in designing these systems is balancing the need for information concerning the members providing content, the social inequalities that more information may create or perpetuate, and the behavior changes that result from visibly segregating members into groups.

Peer-to-peer feedback systems within eNoP rarely have algorithms that filter votes in or out by, for instance, accounting for the social or cultural context surrounding the social interaction instead opting for an unfiltered, uncensored approach where all members may participate and all votes count towards a member’s total score. On the surface this seems like an effective strategy, but it has been demonstrated in an economic context that under certain conditions aggregated information posted less frequently provides higher average levels of cooperation and efficiency relative to more detailed information posted immediately (Dellarocas, 2006). Chen et al. (2011)
argue using game theory that moderated feedback mechanisms are superior to un-moderated feedback mechanisms in terms of the expected performance of the overall community.

Wang and Chiang (2009) further suggest that institutional mechanisms such as peer-to-peer feedback systems might be more effective in fostering long-term community growth if these systems incorporate social, contextual factors into their design. The results of my study suggest that incorporating social and occupational cultural factors into the design of these systems might also be an effective means to reduce the ‘noise’ associated with voting practices in order to maximize the intended purpose of these types of systems. For example, one possible way to reduce the Matthew effect might be to consider eliminating older votes or weighting them less when calculating a member’s total score. This might help reduce the cumulative advantage that those members with high scores have built into the existing unfiltered process while still taking advantage of the motivational effects that these systems promote. Another possible way to reduce this cumulative advantage might be to implement an algorithm that determines the probability of negative or positive votes between the giver and receiver based on the practice related data entered in each member’s profile and previous voting history of all members at the eNoP (as I did in this study but in an automated manner). Based on these probabilities (which will inevitably vary from eNoP to eNoP and will change as new votes are entered into the system), the feedback system then only counts a random number of those votes towards a member’s total score.

The strong effect of group style violations on the propensity of a negative vote provides eNoP site administrators with a bit of a conundrum. This finding may, on the one hand, be a positive appropriation of the peer-to-peer feedback system, because the negative votes may ensure that new eNoP members learn the social dynamics, tone of the discussion forum, and group style before posting within a given forum. This may prevent certain disruptions to the dynamics of the eNoP
due to members not understanding what it means to be a part of the group and/or the occupational culture. On the other hand, however, punishing group style violations this severely relative to the small effect size of the positive quality post variable may make the eNoP less open to outsiders, because outsiders may be afraid to participate for fear of being publically downgraded. Consequently, this type of usage of the peer-to-peer feedback system may promote lurking or hinder the growth of certain electronic social structures.

**Limitations and Future Research**

A limitation of my study is that it is situated in a single, diverse field within a single occupational culture. TPC has forums spanning the spectrum of programming paradigms and ideologies within the occupational culture of software development, and, consequently, there is no dominant class habitus in this field as high class members within this eNoP have been socialized in many different manners (based on my four dimensions of habitus). Although the habitus difference variable was highly significant with a moderate effect size in my study, the impact that habitus differences has on voting practices may be even greater in an eNoP such as Microsoft’s Channel 9 or the Java OTN Forums. For example, a Java/Linux developer may be met with much less cordiality at Channel 9 than at TPC due to Channel 9 being presumably dominated by .NET/Microsoft developers. Future research may look to empirically test and possibly extend my model by investigating an eNoP with clearly defined dominant and dominated classes of members based on their professional habitus.

Additionally, a field is a place of both competition and cooperation (Bourdieu & Wacquant, 1992). Both TPC and the occupational culture of software development are highly competitive. An interesting future study would be to investigate my model in a less competitive or a more cooperative field, possibly a not-for-profit eNoP. It would seem reasonable to expect habitus
differences to be less salient in these types of fields relative to more competitive fields, because the common good may override dispositional differences between members. Consequently, the voting practices and the use of the peer-to-peer feedback system may be quite different in those types of fields. However, the idea that it is important to understand the culture, the social structure, and the group style in order to understand the voting practices should still be relevant.
CHAPTER 4. Conclusion

I motivated this dissertation by pointing out that eNoP have problems motivating contributions due to the free riding dilemma and distinguishing contribution quality due to low barriers to entry. One means to address both of these problems is through the implementation of peer-to-peer feedback systems, which many eNoP have already done in some form (Crowston, et al., 2012; Kollock, 1999; Preece & Schneiderman, 2009). Results from both studies in my dissertation demonstrate empirically that peer-to-peer feedback systems are promoting future high-quality contributions to some degree (Study 1) and are providing a partial means to stratify the membership based on dimensions of quality as a portion of the variability in voting behaviors was found to be attributable to the quality of the post on the positive side (Study 2). However, my results also show that there are other impactful motivators (affective third place attachment and third place identity claims), and there is significant ‘noise’ associated with accumulated votes (reproducing the social order irrespective of contribution quality) within peer-to-peer feedback systems. Understanding social and cultural dynamics using theories of place and social stratification might enable systems designers to design these systems in a manner which may maximize their effectiveness in terms of motivating contributions and of socially stratifying the membership along dimensions of quality.

Roberts et al. (2006) argue that motivators interact in complex ways. The results from my first study contribute to Roberts et al. (2006) by demonstrating empirically that the usefulness of the peer-to-peer feedback system in terms of motivating future high quality contributions and maintaining active membership can be qualified by how affectively attached a member is to the third place portions of the eNoP and by third place identity claims. The results from the first study also demonstrate empirically that the feedback system may not have a consistent motivational
impact for all members. The impact that the peer-to-peer feedback system had in terms of motivating future practice-oriented contributions was greater for those members who had strong third place identity claims and affective third place attachment to the eNoP. Hsieh et al. (2011) argue that extrinsic motivators such as reputation and status are elements of habitus. If this is the case, then it may be that those members who have a higher affective third place attachment and/or greater third place identity claims to the eNoP have a different habitus related to the eNoP and/or occupational culture. As a result, those members may have different expectations concerning the importance of their scores within the peer-to-peer feedback system within the specific eNoP. Therefore, the usefulness of the feedback system in terms of motivating future contributions may also be related to the habitus of the eNoP members.

Although each study makes a separate contribution to the literature, the studies together make several contributions (see Figure 1 in Chapter 1 of the dissertation). First, cultural sociology perspectives and theories of place both complement existing eNoP literature and shift the focus of the eNoP literature away from a resource exchange perspective to more of a social (or cultural) systems perspective (Kraut, et al., 2010). eNoP may be designed to share domain-specific knowledge, information, and advice, but these sites also offer rich opportunities for sociability. A resource exchange perspective often views off-topic social interactions as noise distracting members from the practical purpose of the site (Phang, et al., 2009; Preece, 2000; Preece & Schneiderman, 2009), but a social (or cultural) systems perspective views these off-topic social interactions as possible third place style mechanisms with distinctive cultures and group styles (Oldenburg, 1989), which may strengthen the overall eNoP and strengthen the quality of the resources being exchanged on the practice-side of the eNoP. Issues of social stratification and culture in interaction further support the idea that eNoP might be better understood through a
social (or cultural) systems perspective as social (or cultural) systems are places with social hierarchies, class distinctions, and group styles, which may impact social interactions and the exchange of resources.

Second, the NoP and eNoP literature broadened the concept of communities of practice (CoP) to focus on the structure of the network (i.e. various measures of network centrality and network density) that form around a specific practice in the absence of core CoP concepts such as trust, reciprocity, and mutual engagement (Brown & Duguid, 2000; McLure Wasko & Faraj, 2005; Whelan, 2007). My research suggests that researchers may consider broadening the concept of NoP and eNoP to focus on the structure of the field as opposed to (or in addition to) the structure of the network. Focusing on networking constructs may be too limited given how many of these eNoP have evolved over the years. A field of practice, on the other hand, may have multiple spaces of interaction including third place style forums, which may influence the social dynamics in other areas of the field (Levina & Vaast, 2008). Fligstein and McAdam (2011, pp. 21-22) state that “if a field is really an arena where individuals, groups, or organizations face off to capture some gain as our view suggests, then the underlying logic of fields is not a network of ties, but power and culture.” Focusing on the field more broadly enables these electronic social structures to be conceptualized as places (imbued with different meanings depending on place attachment and place identity claims) of both competition and cooperation, facilitated by score keeping mechanisms such as peer-to-peer feedback systems.

In general, the eNoP literature defines the structure of an eNoP via market based ties using traditional networking constructs and variables (Whelan, 2007). According to Bourdieu, however, a field is structured through both objective (positions and class distinctions) and subjective (habitus) factors (Bourdieu & Passeron, 1990; Bourdieu & Wacquant, 1992). There are certain
groups of individuals who may possess more or less symbolic authority than others within a given field, and focusing on social networking constructs alone may not capture these factors in their analyses. In reference to the importance of habitus as a generative structure, Bourdieu (1990a, p. 81) states that “interpersonal relations are never, except in appearance, individual-to-individual relationships and the truth of the interaction is never entirely contained in the interaction.” I propose integrating a concept such as habitus in conjunction with positions anchored in different forms of capital (i.e. social capital or network centrality) may capture this subjective component, which may enhance the explanatory power of core networking constructs.

Third, the eNoP literature focuses on properties of emergence (McLure Wasko & Faraj, 2005), but many eNoP have been around for many years with well-defined class structures and social hierarchies. Theories of place (participation in the symbols of place) and Bourdieu’s idea that class divisions lead to the reproduction of practices are helpful in explaining social dynamics in these contexts. Wacquant (2007, p. 2) translates a passage from Bourdieu as follows:

Social groups, and particularly social classes, exist, so to speak, twice, and do so before the intervention of scientific observation itself: they exist in the objectivity of the first order, that which is recorded by the distribution of material properties; they exist in the objectivity of the second order, that of classifications and representations produced by agents on the basis of a practical knowledge of these distributions.

Core CoP concepts such as legitimate peripheral participation are still relevant, but understood from a Bourdieu perspective as a process of imposing the dominant class habitus on peripheral participants. The focus of much of Bourdieu’s social theory is on how practices get reproduced based on dominant and subordinate groups (or classes) competing for resources (forms of capital) and competing over the meaning of a particular set of practices or symbolic representations (dominant habitus). In this manner, peripheral members acquire a habitus and a set of mental schemata consistent with the dominant group(s) within a given eNoP. As such,
The different classes and class fractions are engaged in a symbolic struggle properly speaking, one aimed at imposing the definition of the social world that is best suited to their interests. The field of ideological stances thus reproduces in transfigured form the field of social positions (Bourdieu, 1991, p. 167)

Those members that have a deep attachment to the eNoP may be able to socialize peripheral members in a specific manner, thereby shaping the habitus of those members and subsequently structuring the field.

From a practical perspective, Wang and Chiang (2009) argue that institutional mechanisms such as peer-to-peer feedback systems might be more effective in fostering long term community growth if these systems incorporate contextual factors into their design. My two studies focus on third place attachment, third place identity claims and issues related to structural and dispositional differences between members as the primary social, cultural and contextual factors related to social dynamics. Therefore, systems designers may want to account for these social and cultural factors when designing peer-to-peer feedback systems in order to maximize their stated design goals of motivating future practice-oriented contributions and to minimize their use in terms of promoting the Matthew effect and reproducing the social order, especially when the social order is not determined based on dimensions of quality. This may, possibly, be done by having dynamic algorithms within these systems designed in relation to the specific occupational culture governing the eNoP. These algorithms may filter votes in and/or out by, for instance, analyzing voting patterns within the particular eNoP in relation to specific attributes defined in each member’s personal profile (similar to what I did in Study 2 but in an automated manner). eNoP site owners may also promote greater practice-related participation by marketing these sites as more than narrowly defined practice-related question and answer sites. The results from my first study in particular suggest that marketing these sites as social sites with third place style forums in addition
to the practice-related forums may be an effective means to attract and retain membership and to maximize the usefulness of the peer-to-peer feedback system.

This dissertation has provided valuable insights into the social dynamics of eNoP using theories of place and Bourdieu’s integrated social theory, but it has also introduced new questions, which will require future investigation. For example, do members who are socialized within an eNoP primarily through the third place portions of the site develop a different (site level) habitus relative to those members who are socialized within the practice-oriented aspects of the eNoP? Furthermore, what would happen when those different classes of members interact in a neutral forum, say the TPC Cubicle? Based on the results of this dissertation, particularly in Study 2, I would expect there to be tension between those different classes of members, especially if one class does not understand the group style of the space of interaction. The results from Study 1 also suggest that members who have different place attachment (developed primarily via the third place portions of the site) may have different underlying assumptions concerning the eNoP, which is an element of a member’s habitus as it relates to the specific site (Hsieh, et al., 2011). In the second study, I investigated voting practices in relation to professional habitus differences and not site specific habitus differences. Integrating site level habitus similarities and differences into the model of voting behaviors might reveal some interesting interaction effects with group style violations and professional habitus differences. There are also other means of expressing differences within these sites outside of the peer-to-peer feedback system such as types and ways of responding to posts. Performing a discourse analysis of posting activities in relation to both professional and site level habitus similarities and differences along with group style violations might reveal some interesting social dynamics in terms of language use and types of responses.
Arrigara and Levina (2008) argue that user-generated content sites such as Reddit and Digg represent online cultural fields, because members share a common cultural affinity and field members control the trajectory of other members through their actions. A context extension (Lee & Baskerville, 2003) outside of an eNoP environment would be an important future study in order to test the applicability of my findings in different online cultural fields outside of the narrowly defined eNoP sites, which are tightly coupled with occupational cultures (Trice, 1993). In sites such as Youtube and Reddit, members may come from different, possibly overlapping, fields with different socialized dispositions (habitus), but are interacting on a common platform. Based on Bourdieu’s integrated social theory, “one acts spontaneously as one ‘should,’ like a fish in water – while lines of action objectively incompatible with the conditions at hand are excluded as unthinkable” (Emirbayer & Johnson, 2008, p. 32). Are sites such as Reddit and Youtube tantamount to taking a ‘fish out of water?’ An individual’s habitus provides his/her feel for the game, but, for instance, taking a fish out of water may render his/her habitus incompatible with the current field or space of interaction (Bourdieu & Wacquant, 1992). As such, future research may address whether these cross-field dynamics impact social interaction patterns both within their peer-to-peer feedback systems and outside of those feedback systems. Additionally, would it be possible for sites such as Digg, Twitter, and Reddit to develop third place style dynamics and how would those third place style dynamics (if they exist) impact other site level activities?

Another interesting future study would be to test cultural factors in relation to voting practices and/or social interaction patterns in relation to context specific cultural fields. An online cultural field such as www.patientslikeme.com where patients with similar illnesses gather to find support and motivation in relation to a specific illness might offer an interesting environment to study social interactions from a cultural sociology perspective. It may be that the similar contextual
factor bringing the people together (similar illnesses as with [www.patientslikeme.com](http://www.patientslikeme.com)) might mitigate any class differences and habitus differences related to social interactions in that field. Alternatively, if certain members find out that high class members of the forum have access to certain medication or treatment options that low class members of the forum do not have access to, then that may lead to a greater amount of tension between different members.

Many eNoP, particularly in the software development industry but in other industries as well, are no longer simply places to discuss domain specific problems. These eNoP have evolved into much broader social structures over the years offering many different types of forums and places of interaction. Furthermore, many members have been dedicated inhabitants of these eNoP for many years. I have argued and demonstrated empirically in this dissertation that understanding place attachment and place identity claims particularly related to the third place portions of the site are important factors to consider when explaining why members remain active and in terms of the usefulness of the peer-to-peer feedback system in this process. Using weak domain specific ties in order to explain the flow of knowledge, information and advice within these eNoP is no longer adequate due to the evolution and maturation of many eNoP. Furthermore, the impact that the peer-to-peer feedback system has in this process is difficult to determine, because a vote is a complex social and cultural phenomenon. It is important to understand those social and cultural factors in order to evaluate the usefulness of the peer-to-peer feedback system in terms of promoting future practice-related contributions and in order to understand the actual meaning of accumulated scores within those systems.
APPENDIX A: Institutional Review Board Waiver

UNIVERSITY OF HAWAI'I
Committee on Human Studies

August 3, 2011

TO: Tom Mattson
Principal Investigator
College of Business

FROM: Nancy R. King
Director


This letter is your record of CHS approval of this study as exempt.

On August 3, 2011, the University of Hawai‘i (UH) Committee on Human Studies (CHS) approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45 CFR 46 (4).

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at http://www.hawaii.edu/irb/html/manual/appendices/A/belmont.html

Exempt studies do not require regular continuing review by the Committee on Human Studies. However, if you propose to modify your study, you must receive approval from CHS prior to implementing any changes. You can submit your proposed changes via email at uhirb@hawaii.edu. (The subject line should read: Exempt Study Modification.) CHS may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify CHS when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact CHS at 956-5007 or uhirb@hawaii.edu. We wish you success in carrying out your research project.

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