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THE IMPACT OF EMOTIONAL EXPRESSIONS ON KNOWLEDGE CREATION IN ONLINE COMMUNITIES

Research-in-Progress

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Abstract

People become involved in online communities (OCs) to obtain information, share ideas, or create knowledge. In an OC with a text-based and asynchronous communication environment, knowledge is created and embedded in the dialogues codified into text-format. While most extant studies in OCs focus on social, structural, and cognitive factors leading to knowledge creation, little effort has been made to investigate more affective factors leading to knowledge creation. In this paper, we investigate the role of Emotional Expression (EE) triggering knowledge creation processes. We hypothesize that EE in OC triggers two processes for the quality of knowledge creation: sharing experiences and sustaining dialogues. Moreover, recombining ideas moderates the relationship between “sharing experiences” and the “quality of knowledge”. The hypotheses will be tested with data from an OC on “Business Ph.D. programs”. We conclude with possible implications of this study for academy and practice.

Keywords: Knowledge creation, Online communities, Knowledge networks, Emotion, Emotional Expression, Knowledge sharing

Introduction

This paper investigates the impact of emotional expressions during the process of knowledge creation in online communities. Online Communities (OC) are defined as “open collectives of individuals with shared interests and attention to both individual and collective welfare” (Sproull and Arriaga 2007, pp. 1-2) and are pervasive in online interactions. Within or across organizations, OCs can help people overcome limitations of time and space to collaborate in the creation of new outcomes (Kudaravalli and Faraj 2008; Lee and Cole 2003). They can also help people share information and know-how (Zhang and Watts 2008), make friends (e.g., Facebook), discuss common interests (e.g., online discussion forums), and collectively work on writing knowledge contents (e.g., Wikipedia). Thus, knowledge is embedded not only in the outcomes of collaboration for knowledge co-creation in OCs (e.g., Open Source Software: OSS application), but also in the dialogues exchanged by the participants of OCs, as a form of text-based and codified conversations (Wasko, Teigland and Faraj 2009).

Dialogues or interaction can trigger emotional expressions (EE). When people sense (hear, see, and feel) EE from someone else, they tend to respond or even match those emotions with their own EE rather than rationally or cognitively respond to them. The introduction of emotion in the discussion, in turn, changes the relationship's perceptions and affects communication behavior (Waldron and Krone 1991). In the context of OCs, the phenomena of EE may differ from face-to-face (F2F) environments. Within OCs, especially when participation is anonymous and when the topic is equivocal, participants often get into heated discussions and use Emotional Expressions (EE) with people they have never previously met (Faraj, Wasko and Johnson 2008). As shown in the qualitative evidence in this paper, the EE used in OC often triggers long-threaded discussions and these discussions often contain well-articulated information for OC members. Recently, some studies have investigated the phenomena of knowledge creation (KC) in OC and found several important factors for the collaboration among OC members for KC, such as contextualization, critical mass, critical assessment and error correction mechanisms (Kudaravalli and Faraj 2008; Lee and Cole 2003; Wasko et al. 2009). However, these studies left out affective factors. In the balance of this paper, we focus on one affective factor shown in many OCs: Emotional Expressions (EE). Building on the theory of the social function of emotion (Morris and Keltner 2000) we propose a research model to explain the relationship between EE and knowledge creation within OCs. We seek to address the following research question: how do knowledge creation processes enabled by Emotional Expressions in a threaded discussion influence the quality of knowledge created in OCs?

The paper develops as follows. Using current research on knowledge in OCs and the social function of emotion, we develop our research model and the hypotheses on the relationship among EE, sharing experiences, sustaining dialogues, recombining ideas and the quality of knowledge created within OCs. We then describe the research design that will be used to test these hypotheses. Results of this data analysis will be presented at the conference.

Theoretical Background

Factors affecting knowledge creation in Online Communities

Online communities exist for many different purposes such as knowledge sharing (Zhang and Watts 2008), collaboration for work (Kudaravalli and Faraj 2008), collaborative knowledge co-creation (Lee and Cole 2003), learning, networking (e.g., Facebook), marketing (de Valck, van Bruggen and Wierenga 2009), entertainment, and friendship. Even though there are several devices (computers, mobile hand-held devices (e.g., smartphones), video conferencing tools) (Jarvenpaa and Kankanhalli 2010) and technologies that support OCs, text-based asynchronous communication technologies, such as email and e-bulletin boards, are dominant.

Despite the diversity of purposes and of supporting technologies, some of the main characteristics common to different OCs can be identified. First, as the barrier to becoming a member of an OC is low, the boundaries of OCs are more fluid than the boundaries of formal groups in organizational contexts (Faraj, Jarvenpaa and Majchrzak 2010; Faraj et al. 2008). However, even if it is easy to join an OC, all members may not be active participants in the knowledge creation process. For example, in an OC studied by Kuk (2006), 60% of postings were contributed by only 16% of its members. Second, the relationships among members tend to be flat (less hierarchical than in organizational contexts). Thus, it is less important to find out who participated. Often, participation is made under the condition of anonymity, so that what is written in a posted content is more important than who wrote that posted content. Third, members are tied weakly and are diverse, since they are often geographically dispersed and come

from different cultural backgrounds (Constant, Sproull and Kiesler 1996). Finally, the communication is made via computer-mediated communication (CMC) tools, so that communication is asynchronous, and the knowledge is embedded in codified text-format contents (Faraj et al. 2010; Hansen 1999; Lee and Cole 2003).

Previous studies have investigated the factors that influence individual participation in OCs (Ardichvili, Page and Wentling 2002; Yang, Li, Tan and Teo 2007), as well as factors that influence knowledge contribution and the quality of knowledge (Faraj et al. 2008; Ma and Agarwal 2007; Wasko and Faraj 2000; Wasko and Faraj 2005; Yu and Chu 2007). The factors for participation and contribution of knowledge are structural (centrality) (Wasko and Faraj 2005), system-related (system quality) (Lin 2008), cognitive (outcome expectancy, cost and benefit, and expertise) (Kankanhalli, Tan and Wei 2005; Wasko and Faraj 2005; Yang et al. 2007), social (commitment and reciprocity) (Wasko and Faraj 2005), and personal (personality) (Yu and Chu 2007). In the same vein, researchers have also investigated the antecedents of *sustained* participation. Positive responses toward one's postings, construction of one's identity, and situated learning make people continue to participate in OCs (Fang and Neufeld 2008; Joyce and Kraut 2006). Another important research topic on OCs is the collaboration mechanisms for knowledge co-creation within OCs. Kudaravalli and Faraj (2008) found that specific dialogic interactions related to question articulation and contextualization can sustain collaborative knowledge creation in OCs. Within the context of open source development, Lee and Cole (2003) focused on the importance of a critical assessment of others' work and the error correction mechanism as key mechanisms for knowledge creation. Finally, Wasko et al. (2009) argue that a generalized reciprocity exchange regime is crucial in generating a critical mass of discussion and the development of relational ties (e.g., trust, and commitment) in order to sustain the creation of new knowledge.

These studies have improved our understanding of what leads to participation, contribution, discussions, collaboration, and knowledge creation. While these studies have made valuable contributions to the IS field and its reference fields, the factors that have been studied so far are either structural (e.g., critical mass, relational ties, and so on), cognitive (e.g., critical assessment and error correction, articulation and clarification in dialogues, and returned participation), or social factors (e.g., strategic interaction) (Kudaravalli and Faraj 2008; Kuk 2006; Lee and Cole 2003; Wasko et al. 2009). However, anecdotal evidences show that affective factors can also facilitate knowledge-creating discussions within OC. That is, at the level of threaded discussion, under the same structural, cognitive, and social conditions, some discussions can be more facilitated than others because of the EE used by the participants. For example, using emoticons may break the psychological barriers among OC members and transfer emotional cues that cannot be fully explained by text-format (Walther and D'addario 2001). Also, using EE that arouse others emotions are likely to trigger reactions by others. As such, while EE often are shown in quite a few threaded discussions, little empirical effort has been made to investigate the impact of EEs on KC in OC. Therefore, this study aims at improving our understanding of the role of EE in knowledge creation within OCs.

Social Function of Emotional Expressions

Emotion is multifaceted phenomena, defined as "general or specific affective status of individuals on a certain reference target" (Morris and Keltner 2000, p.7). Emotions can refer to a general affective status of an individual, such as positive or negative moods, or to more specific or discrete affect (e.g., anger, joy, happiness, and fear) (Brief and Weiss 2002; Morris and Keltner 2000). Discrete emotions, such as anger and joy, can be categorized into either positive or negative emotions (Diener, Smith and Fujita 1995). Emotion can also be either intrapersonal or interpersonal (Morris and Keltner 2000). The *intrapersonal view* of emotion considers an individual's internal emotional experience, which plays within a person's mind and influences her/his behavior (Isen 1991). On the other hand, another stream of emotion theory considers emotion as *interpersonal interaction*. This stream of research focuses on the role of external and observable expression of emotion in communication among people (Rafaeli and Sutton 1991). Thus, emotion is either *felt* internally by one person (the intrapersonal view of emotion) or *expressed* to others (the interpersonal view of EE). In this study, we focus on the interpersonal aspect of *expressed* emotions and we use the *theory of the social function of emotion* (Morris and Keltner 2000; Rafaeli and Sutton 1991). The social function of emotion posits that an EE is made following relational problems triggered by the social context. When EEs are used by someone involved in the context, others will respond to the EEs by behavioral change. However, there is no claim that this behavior triggered by EE always solves problems. The process linking social contexts, relational problems, EE, and behavioral responses is not deterministic, but is rather a general heuristic for further theoretical development in different contexts (Morris and Keltner 2000).

Conventional explanations and findings from research on the *social function of emotion* suggest that EE can influence others' responses and behaviors and can enable coordinated interaction such as courtship and appeasement

rituals (Morris and Keltner 2000), communicative behavior (Keltner and Ekman 2000), and psychological responses (Levenson, Ekman and Friesen 1990). Extant studies in this research stream have also identified the different impacts of each discrete dimension of EE. For example, the expression of *kindness* is reciprocated by others with kind responses (Cialdini, Vincent, Lewis, Catlan, Wheeler and Darby 1975; Rafaeli and Sutton 1991), the expression of *gratitude* works as a reward for other’s cooperation (Morris and Keltner 2000), and showing *openness* to someone influences the target person to communicate more sincerely (Waldron and Krone 1991). As such, in conventional interaction (F2F, Synchronous, and Dyadic), positive EEs tend to result in positive reactions by the targets of EEs. However, people can respond to negative EEs with both positive and negative behaviors. For example, a negative EE, such as irritation, can influence others’ motivation to work (when the relationship is between a general manager and workers) (Kipnis 1984), representing a positive reaction, or can be reciprocated with another irritating expression, representing a negative reaction. The same thing can happen with anger, which can motivate restitutive behavior of the target (positive reaction), or it can make people avoid or cease communication (negative reaction) (Waldron and Krone 1991). In sum, while previous studies suggest reactions for each discrete EE (either positive or negative) under different contextual environments, they do not determine which of the positive or negative EEs result in stronger reactions.

One can observe that people use emotional expressions in the context of anonymous participation in OCs.. In general, emotions are elicited by identifiable problems in relationships (Morris and Keltner 2000). Since the participation is anonymous, we can expect that EE is used more often and easily (mindlessly) by participants without significant identifiable problems because of the deindividuation effect (Festinger, Pepitone and Newcomb 1952). The forms of EEs in OCs can be overt or covert EE (expressions that do not overtly show any emotional expression, but may cause emotional arousal of other people). People use “emoticons” to express their happiness, humor, and frustration. Thompson and Foulger (1996) define emoticons as “pictographs to express emotion or surrogates for nonverbal communication in CMC” (p. 226) in their study. These symbols are widely and commonly used as not only one way to express affect in CMC, but also alternative expressions to supplement missing points in CMC in comparison to F2F communication (Walther and D’addario 2001). They state that emoticons serve the function of complementing verbal messages in CMC. In addition, they found that negative emoticons make negative messages more negative, and the negativity of the response functions as arousing the other’s interest. Or people use the responses or answers to others’ opinions quite cynically or negatively so that the posters of the opinions can be emotionally aroused. Emotional Expression can be used in both initiating threads (e.g., showing happiness or sadness about one’s situation to start a conversation) and in following threads (such as in replies with EE to others’ postings). Also, EEs shown in OCs can be directed toward others’ postings/situations (e.g., showing anger toward others’ comments) or toward oneself (e.g., lamenting one’s own situation). Examples of positive and negative emotional expressions are shown in table 1. These EEs can be more or less specific: some involve showing gratitude toward others’ answers, exhibiting happiness using emoticons, and expressing pride toward an achievement (Positive EE). In the same discussion, some people may express their anger, frustration, sadness, and embarrassment using various overt or covert EEs (Negative EE). As such, in a threaded discussion with many anonymous members of an OC, a variety of both positive and negative EEs can occur. In this study, we do not argue any differential influence of positive or negative EEs on the processes of knowledge creation. Rather, we will argue that the degree of EEs (whether positive or negative) used in a threaded discussion is positively associated with the degree of knowledge creation processes.

Table 1. Examples of Negative or Positive Emotional Expressions	
Negative Emotional Expression	Positive Emotional Expression
Your posting is so funny and ridiculous (disdain) Frankly speaking, your posting is horrible and makes my feeling so bad (raillery), Are you idiot? (anger) I don’t trust your saying. Liar ~, -++ (disregard) Ah~~~, I don’t know what to do now (lament)	Thank you so much (gratitude) I love this article and recommend this as the best thread of the year (Satisfaction), So Cool~~ ^^ (admiration) Very good. Thanks a lot :) (Happiness) I’m very proud to say that... (Pride)

The processes of knowledge creation in OCs

In this type of OCs, knowledge is created and exists within the dialogue of participants. Knowledge is the public good, collectively owned by OC members and created through the posting of questions and replies. That is, knowledge creation processes often take the form of a conversation (Wasko et al. 2009). People may participate in the OC for a variety of motivations, such as acquiring information and generating knowledge from the generalized

exchange of knowledge among participants. The generalized reciprocity mechanism matters in that many participants who have been helped by a specific individual often cannot directly reciprocate toward that person because they lack the specific knowledge needed. Instead, they help by answering questions posed by others. This leads to a generalized rather than reciprocal form of knowledge sharing, and is one of the building blocks for a long-lasting and effective OC (Wasko et al. 2009). In this study, we focus on the role of EEs on knowledge creation processes and outcomes in such an information-sharing OC.

We suggest that three different processes underlie knowledge creation within an OC, following the initial posting of a question. The first process—*experience sharing*—occurs when participants share specific experiences or use counter-experiences as a way of validating their arguments or weakening an opponent's point. The second process—*sustaining dialogues*—emphasizes the exchange that occurs when participants clarify and articulate the issues being discussed (Kudaravalli and Faraj 2008). The last process—*recombination of ideas*—occurs when participants either synthesize the existing points-of-view or offer a novel recombination that transcends previous formulations. We suggest that these processes play a key role in enabling knowledge creation in OCs. Our focus is on the quality of the knowledge created. We define *quality of knowledge being generated* as the degree to which knowledge embedded in the discussion is perceived as truthful, relevant, and helpful to the members of the OC (Sussman and Siegal 2003; Zhang and Watts 2008).

Research Model

Emotional Expressions as a trigger for the process of sharing experiences in OCs

In the environment of OCs characterized by 1) anonymity in participation; 2) the use of lean media for communication (mostly text-based asynchronous communication tools); and 3) generalized exchange, we expect that reactions to an emotional stimuli will be different than in an F2F environment.

One of the most important characteristics of OCs in this regard is *anonymity*. Some studies have investigated the effect of anonymity in Internet-based communication environments. One stream of research using deindividuation theory (Festinger et al. 1952) argues that anonymity on the Internet influences aggressive and uninhibited behaviors of individuals (Chiou 2006; Douglas and McGarty 2001). Another stream of research using SIDE (Social Identity model of Deindividuation Effects) (Reicher, Spears and Postmes 1995) posits that if an individual regards the group as important and s/he can identify her/himself within the group, s/he tends to show pro-social behavior (Kugihara 2001; Postmes, Spears, Sakhel and de Groot 2001). The context of OCs seems closer to the second approach. Participants join OCs voluntarily to obtain information and share their knowledge. Thus, they tend to perceive this OC as important for them, and they can socially identify themselves within the OC. Also, the participants who put comments (a form of knowledge contribution behavior) on the posted contents are even more seriously involved and socially identify themselves in the OC (Wasko and Faraj 2005). According to the social function of Emotions, the recipients of EEs should react by changing their perceptions or behaviors. In F2F environment, EEs may cause different reactions by using facial, postural, gestural, and speech cues (Morris and Keltner 2000). However, in the environment of text-based communication in OCs, the only way to show reactions to others' EE is to express their opinions by replying to comments. Thus, the comments posted as reactions to EEs tend to be pro-social. Pro-social behaviors in OCs refer to the informative contents added to a discussion. To make knowledge contents informative in OCs, where source credibility (Chaiken 1980) does not have an effect (in anonymous participation), one can share his/her experiences to improve the validity and plausibility of his/her argument (Zhang and Watts 2008). For example, a lamenting expression: "*Ah me! What can I do?*" is often followed by a reaction of others sharing their own experiences: "*Don't worry. I have one of my friends who had the same situation as yours, but he overcame it by ~.*" Or some people use EE together with their experiences to react to others' EE; "*That's kind of nonsense! I am a student in that school and I know that we ~.*" As such, in OC environments, where anonymity and the pro-social behavior of knowledge contributors interplay together, EEs are often addressed by people who support their argument by sharing their own or others' experiences.

Another important characteristic of OCs in this regard is the "asynchronous communication environment." Emotion and its reaction in F2F environments are very temporal and transient, so that emotional reactions to EEs should be very spontaneous (Clark 1993). However in the context of asynchronous communication, people can take some time before they respond to EEs, so there is time given for them to reflect on their own or others' experiences to support their argument for their reaction to EEs, rather than showing spontaneous reactions. Thus, the argument made as a

response to EEs in OCs can be more elaborate. In sum, in OCs, the more a threaded discussion has EEs, the more attempts will be made to share personal experiences within the thread.

H1: In the context of a threaded discussion in OCs, the degree of emotional expression is positively associated with the degree of sharing experiences.

Emotional Expressions as trigger for the process of sustaining dialogue in OCs

Since the members of an OC are from different backgrounds and different geographical locations, very often the contextual details of an initial message are misunderstood (if not, partially understood) by the participants of an OC. The Sustaining Dialogue in an OC refers to the process within a discussion made to confirm the accuracy of participating members' contextual understanding of the issues discussed in a threaded discussion. This process of sustaining dialogue can be unfolded into three sub-processes: 1) clarifying issues of a topic; 2) asking follow-up questions (to reconfirm a current issue of a topic or to ask another question related to an initial topic); and 3) referring to others' posts or disciplinary issues (Kudaravalli and Faraj 2008).

We argue that sustaining dialogue is another process of knowledge creation triggered by Emotional Expressions in OCs. According to the social function of emotion, EEs are triggered by relational problems in a certain context (Morris and Keltner 2000). In the context of OCs, where the contextual backgrounds of members are different and oftentimes geographically dispersed, the relational problems within a discussion that trigger EEs can often be caused by different interpretations of initially posted contents. As mentioned previously, because of a higher social identity of active participants and the asynchronous and text-based environment, EEs that results from misunderstanding of the initial or target postings will trigger sustaining dialogues as a kind of pro-social behavior. These sustaining dialogues triggered by EEs should occur the way generalized exchanges occur. EEs trigger the social communicative interaction of all participants who read the posted contents (Kraut and Johnston 1979; Morris and Keltner 2000). As such, EEs to a posted content (the target content of the EE) trigger responses not only by the person who posted the target content, but also by many other members who have different contextual backgrounds and who want to sustain the dialogue.

For example, an initial posting that is not well articulated in terms of its contextual details can be responded by an EE that expresses cynicism: e.g., "*Your question or issue is too vague to answer!*" Or, "*What else can I tell you, except 'it depends.'*" These EEs should be addressed by the initial poster or those who know the context of the initial poster's situation, using one type of sustaining dialogue; clarifying the question with more detailed contextual information. Also, when the discussion is heated because the people are polarized into several stances on one issue, Emotional Expressions are often used to refute others' opinions. This heated discussion with a number of EEs should be reconciled by referring to some paradigmatic issues (Kudaravalli and Faraj 2008). A third example of sustaining dialogues to respond to EEs is that when people almost get into verbal fights using mostly negative EEs, asking or suggesting another question related to the current issue or reconfirming the original issue of the discussion makes it more productive. In sum, Emotional Expressions not only encourage members to post informative arguments by sharing their own experiences (H1), but also encourage active participants (who care about the value and sustainability of the OC) to make discussions move forward via sustaining dialogues by, for example, clarifying the initial topic, referring to disciplinary issues, and asking related questions or reconfirming initial questions.

H2: In the context of a threaded discussion in OCs, the degree of emotional expression is positively associated with the degree of sustaining dialogues.

The impact of the knowledge creation processes on the quality of knowledge created

As mentioned before, the quality of knowledge at the level of discussion threads refers to *the degree that knowledge embedded in a threaded discussion is perceived as truthful, relevant, and helpful to the members of the OC* (Sussman and Siegal 2003; Zhang and Watts 2008). Thus, the processes of knowledge creation in each thread should make the knowledge embedded in the dialogue more truthful, relevant and helpful. In the context of anonymous participation for knowledge sharing OC, we argue that two processes – sharing experiences and sustaining dialogues – are the processes that enhance the quality of knowledge in each threaded discussion.

In the anonymous environment of communication in OCs, the validation process is important for the quality of knowledge embedded in posted threads, since there is not many other heuristic keys (such as source credibility) to judge the quality of the knowledge in postings. Repeated comments with shared experiences by weakly tied members of OCs not only validate the truthfulness of the thread (Wathen and Burkell 2002), but also provide

diversified views (Constant et al. 1996) on the topic suggested in the thread. The process of sharing experience makes the knowledge embedded in the dialogue more truthful and diversified views contributed by members from various backgrounds make the knowledge relevant and informative. Thus, the degree of sharing experiences improves the quality of knowledge created within the thread.

H3: In the context of a threaded discussion in OCs, the degree of sharing experiences is positively associated with the quality of knowledge created.

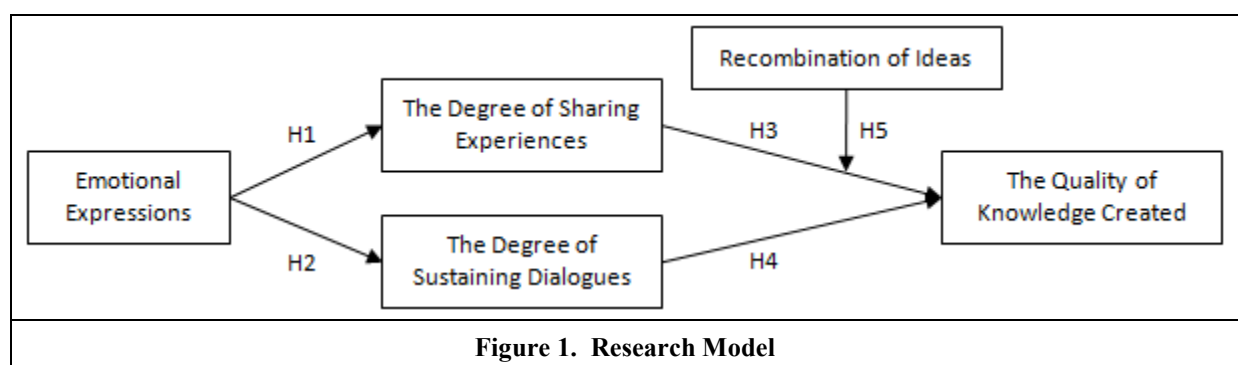
In addition to sharing experiences, we argue that the process of sustaining dialogue is also related to the quality of knowledge created in the threaded discussion. The sustaining dialogue process in OCs occurs when other participants confirm the accuracy of participating members' contextual understanding of the issues discussed in a threaded discussion, since the details in the initial discussion are often not readily understandable by other participants. Quite a few studies have indicated the importance of the kind of interaction in learning and creating knowledge, and also the impact of such interaction in helping knowledge-intensive discussions in electronic networks (Boland and Tenkasi 1995; DeSanctis, Fayardb, Roacha and Jianga 2003; Majchrzak, Beath, Lim and Chin 2005). Kudaravalli and Faraj (2008) suggest that the sustaining dialogue process not only contributes to creating knowledge in electronic networks, but also leads to effective collaboration in discussion threads in online communities. Therefore, the level of sustaining dialogues improves the quality of knowledge created within threads.

H4: In the context of a threaded discussion in OCs, the degree of sustaining dialogues is positively associated with the quality of knowledge created.

Re-combination of ideas as a moderating effect

In the OC created for sharing knowledge, people participate to find answers to their problems from contributors. Thus, they usually do not expect any on-going process, such as collaborating, writing articles or developing OSS applications. In this type of OC, a recombination of members' contributions does not occur all of the time, since the ongoing dialogues made by anonymous participants might be enough for participants. However, when people share direct (about themselves) or indirect (about someone they know) experiences or become polarized into two or several stances on a topic, it is more likely that some participants will contribute to the effort of synthesizing or recombining the posted comments. This effort of recombining previous ideas, or even ideas shown in the other discussion threads, can create new knowledge. The impact of recombining ideas should be especially important when many experiences are shared in discussions. That is, while experiences contributed by members from diversified backgrounds are already important for the quality of knowledge created (Constant et al. 1996), efforts to recombine contributed ideas (experiences shared) should be another important factor in completing knowledge with higher quality. The extant research also suggests that a recombination of ideas and contributions lead to better knowledge creation (Faraj et al. 2010; Kudaravalli and Faraj 2008), and combining codified information into new forms is an important process of knowledge creation (Nonaka 1994). The effort of recombining ideas within thread replies does not deterministically occur via reactions with shared experiences. Rather, it happens from time to time by both the initiators of discussions and third parties, but it influences better knowledge creation when the effort of sharing experiences exist in discussions, which is a moderating effect on the relationship between the degree of sharing experiences and the quality of knowledge creation.

H5: In the context of a threaded discussion in OCs, the degree of recombining ideas positively moderates the relationship between the degree of sharing experiences and the quality of knowledge creation.



Prospective Methodology

Data Source

To address our research question, we will use data from an online community on admission to business Ph.D. programs and real-life issues of business Ph.D. studies in North America and Europe targeted at future students from Korea. This OC is chosen because of the following three reasons. First, most issues circulated in this OC are equivocal, so that there are no correct or incorrect answers for the questions posted, which will generate a good amount of discussions in each discussion thread. Also, many posted comments and answers are pretty controversial, so that both overt EE and covert EE (the posting that can arouse emotional reaction without showing any words related to EE) are used and they trigger the knowledge creation processes. Qualitative evidence of EE and KC processes in this OC is shown in table 2. Second, although research has shown that the way EE are openly expressed, judged (identifying emotions of others), and reacted in *face-to-face (f2f) environment* is different between collectivist culture and individualistic culture (Matsumoto 1990, Matsumoto 1991), so far, no study has suggested any cultural difference of the way EE are used and responded in online interaction among people. In line with this view, we argue that in anonymous OC context, a lot of cues that carries cultural characteristics may not take effect in people’s interaction as strongly as in F2F environment. Thus, the interaction with EE and the following processes (sustaining dialogues, sharing experiences, and combining ideas) can be shown in any types of culture but with different intensity. Therefore, the relationship among EE and following types of dialogue may be applicable to the cultures beyond Korean context. Third, even though it is a community in Korean language, the most issues discussed in this community is on North American or European PhD programs, so that posted contents deal with information and knowledge on North American School.

This online community is supported by bulletin board technology so that members can post and respond to threads anonymously and can voluntarily ask questions, give responses, and make comments that are connected to threaded discussions, similar to conversations. Currently, approximately 2,700 participants (Male: 60%, Female: 40%) have posted over 2,000 thread discussions over the past three years. About 350 visits are made per day.

Table 2. Qualitative evidence of EE, three KC processes in our research site

Posted Dialogue (Translated)	Related Constructs
Initial Question: I’ve got admission letters from School A and School B. School A offer me ~ and School B offer me ~. Which school should I choose?	NA
Comment 1: “I think that school A is better because I think reputation of A is better and the profs in A are more kind and supportive than those in B ~”	Sharing Experience (this can arouse others emotional reaction)
“Well, I think the commenter above says something nonsense and I do not agree with that nonsense. In what ground can you say ~” I actually did my master in school B and the profs are nice and my colleague PhD students are happy with the support from school and profs. Also, I think B is as prestigious as school because ~”	EE (Disregards) Sharing Experiences Sustaining dialogue by mentioning others posting
I simply do not agree with both of you. -_- ;;;; (Frustration: Emoticons) “It is true that school A is good but I think both schools have their own unique strengths. I know that School A is famous for ~ and School B is good for those who ~. Choosing a school is all about what you value in PhD life. Then, you should ask yourself what to value in your case. What do you pursue in your PhD life?”	EE (Emoticon) Sharing experience and Sustaining dialogue to confirming the contextual understanding
...Some EE shown, sustaining dialogues by asking each other (I’m asking the guy who posted 2 postings above, in what ground can you say that? - Disregards)... Sharing experiences shown with EE...	
Although ranking information cannot show the quality of school, there is a website that shows the ranking of the US research schools by their published articles (www.~.com). Please check the rankings of the schools if you value ranking as an important criterion for choosing school.	Sustaining dialogues by referring to disciplinary affiliation
Thanks for letting us know about this website. Very informative ^ ^ (Happiness) !!	EE (Emoticons)
So, now, I think that in this case, it is up to the poster’s decision about which school to choose. School A is good in α , β , γ , and school B is good in δ , θ . But for school A you have to compensate... but in school B... are challenging. Do you guys agree? ☺	Recombining postings by adding and re-categorizing EE (Emoticons)

Measurement

Because our study will use a “threaded discussion – composed of an initial posting followed by many replied comments” as the unit of analysis, we will develop the procedure by creating a coding scheme for the content analysis and by following previous studies (Krippendorff 2004; Kudaravalli and Faraj 2008; Jarvenpaa and Ives 1990; Weber 1990). For content analysis, six raters will be used; two for EE, two for KC processes, and two for the quality of knowledge embedded in each posting. Those raters are recruited from the members of this OC, who do not know the research questions of this paper. Inter-rater validity will be checked during and after rating.

Emotional Expressions: The EE used in our research site are both overt (explicit) and covert (implicit). Overt EE, for example ‘Emoticons’, can be coded by word dictionary SW such as Linguistic Inquiry and Word Count (LIWC), but covert EE may not show any word related to emotions but may cause emotional arousal of people. Thus, instead of machine coding, it is more appropriate to use human raters who can judge the degree of EE in each threaded discussions. We will use the modified coding scheme from (Waldron and Krone 1991) and have two raters check both the amount and intensity of each discrete EE - Anger (Frustration, hate), Sadness (Despair, hurt), Fear (Anxiety, Panic), Negative Surprise (Shock, Disbelief), Joy (Happiness, pride), Positive Surprise (Amazement, astonishment), Affection (Liking, caring) – used in each discussion thread. We will ask the following question to raters; “please indicate each of emotional expression used in the discussion ### and check how intense each EE is in the scale from 1 (very unintense) to 5 (very intense). In sum, the raters will check each of 200 randomly selected discussion thread. EE for each discussion thread will be calculated by averaging the ratings from each discrete EE.

Three Knowledge Creation Processes: To assess *the degree of shared experience*, we will have count the number of unique experiences that are related to the topics of discussion in the threaded discussions. To measure *the degree of sustaining dialogues*, we will identify postings that 1) asks for clarification; 2) refers to what another member said in another message within the thread; 3) contains follow-up questions; and 4) refers to paradigmatic issues or the disciplinary affiliation (Kudaravalli and Faraj 2008). We will also assess *the degree of recombination of ideas*, with the rating scheme of a combination of ideas modified from Nonaka (1994)’s conceptualization of knowledge combination. We will measure whether 1) sorting, 2) adding, 3) re-categorizing, and 4) re-contextualizing of other members posted comments in each threaded discussion exist or not. Again, all four items will be coded 0 or 1.

Dependent Variable: Quality of Knowledge Creation: To assess the dependent variable, the *quality of knowledge created*, we will adapt the rating scheme for the argument quality in the OC developed in Zhang and Watts (2008). We will assess the extent to which knowledge in the threaded discussion is informative, definite, and accurate using a 5-point Likert scale. Finally, we will control for the amount of discussion, since it should correlate with the quality of knowledge created, as well as with the degree of sharing experiences.

Conclusion

Results from this study will contribute to the literature on knowledge creation in online communities. While extant studies have explored the impact of social, cognitive, and structural factors leading to knowledge creation in OCs, this study is among the first to address the role of affective factors in the knowledge creation process in OCs. Using theories on knowledge creation in OCs and the social function of EE, we will explore how EE influences two specific processes leading to knowledge creation: sustaining dialogues and sharing experiences. This study will shed the light on how EEs influence internal dynamics in discussions within OCs (text-based and asynchronous communication environments with anonymity). An important potential implication of this study involves understanding if and how EEs help improving participation and knowledge creation, and eventually ensure the sustainability of OCs. Results from this study will also contribute to the literature on emotions by showing how EE are responded to and generate more fruitful knowledge-creating discussions in OCs as compared to F2F environment. Thus, this study will provide us with a new perspective on how EEs trigger pro-social behavior (responding EEs with informative contents added to a discussion) in the specific context of OC.

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