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# The Emergence of Online Widescale Interaction in Unexpected Events: Assistance, Alliance and Retreat

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# The Emergence of Online Widescale Interaction in Unexpected Events: Assistance, Alliance & Retreat

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## ABSTRACT

This paper examines online, *widescale interaction* during an emergency event of national interest. Widescale interaction describes the potential for broad, immediate, and varied participation that the conditions of online forums, and social networking sites in particular, increasingly allow. Here, we examine a group on a popular social networking site as a virtual destination in the aftermath of the Northern Illinois University (NIU) shootings of February 14, 2008 in relation to related activity that happened in response to the Virginia Tech (VT) tragedy 10 months earlier. We consider features of interactions that are enabled when a vast audience converges under such conditions. We discuss how commiseration and information seeking are interrelated, and how geographical communities that share a common experience ally in such a public, online setting.

## ACM Classification Keywords

H.5.3 Groups & Organization Interfaces—collaborative computing, computer-supported cooperative work, organizational design, K.4.1 Public Policy Issues, K.4.2 Social Issues, K.4.3 Organizational Impacts—computer-supported collaborative work

## Author Keywords

Computer-mediated communication, crisis informatics, disaster, emergency, social networking sites.

## INTRODUCTION

Digital connection through information and communications technology (ICT) between people far and wide has become an integral part of our lives, such that a generation of people no longer associate such capability and applications to work-related matters [6]. Social networking sites, like Facebook, MySpace and Orkut, which have been

the subject of recent research attention [4, 5, 8, 18, 22, 23], offer new variation in computer-mediated communication (CMC). Social networking sites have become destinations for many, with the initial entrée to the space often facilitated by invitations from people they already know. This differs from other, earlier forms of online groups, where the attraction to join is often more clearly motivated around a particular goal or topic that participants themselves pursue.

The audiences that social networking sites have created are vast and ready, with members organizing themselves around whims of fancy, ambitious pursuits, and their personal relationships to each other. Over the course of 2007-2008, we have also seen how this audience can self-organize around unexpected events, where immediacy of response is often what is required or desired, and where the collective processing power that such large audiences can have produces remarkable results [30]. It is this convergence and focusing around a topic by a large audience that we call *widescale interaction*.

## Collective Behavior in Emergency Events

Disaster and crisis situations are non-routine events that result in a host of non-routine behaviors and new social arrangements, including self-organization by members of the public, in response to emergent needs [11, 19, 21, 36, 38, 40]. Events throughout history demonstrate how people in disaster situations are motivated to help others, offer support, and ameliorate the severity of the crisis in remarkable and innovative ways [1, 29, 35, 37].

Modern disaster and crisis situations reveal such innovative behavior extending to online settings. The use of social networking and media sites, blogs, photosharing and similar forums allow people around the world to participate in the processes of crisis recovery [16, 25, 30, 37, 40] by providing a medium of assistance and social support.

## Online Social Support

The practice of online offerings of help—both technical and social—is as old as the Internet, with the creation in 1981 of the Usenet being an early indication of this behavior [20]. Increasingly, in the research and development of human

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computer interaction, online destinations have been imagined, realized and studied as places for people to come together for social support. For example, Preece points to participants in online health support communities who return to these settings once they have recovered, “to share their experience, to help, and to offer support to current sufferers” [32, 33]. Farnham and colleagues [10] studied the participation of cancer patients and their families in an online community called HutchWorld, finding that its use “helped to buffer study participants against reductions in life satisfaction and social support” (p. 375). Pfeil and Zaphiris examined a discussion board on the topic of depression on SeniorNet, an online community for elders, and found that users join the group “because they want to talk about themselves; they seek help and use the discussion board as an opportunity to freely reveal their emotions and their situation” [31]. In a recent report on helping in a natural hazards disaster, Torrey and colleagues [39] discuss the “connected giving communities” that arose out of the August/September 2005 Katrina/Rita hurricanes to offer shelter and other relief services to evacuees by considering the way online, decentralized organizations function. In our work here, we consider similar issues of online social organization, but around offers of information assistance for large, crime-related emergency events, which have perhaps different requirements for online interaction. Furthermore, we focus on the specific kinds of activity that took place on a popular social networking site, a new destination for social interaction in times of disaster.

### **Social Networking Sites as Places of Convergence**

Social phenomena arising within the context of social networking sites have become the subject of new scholarly research. Lampe and colleagues [23] have examined how profile structure affects the number of Facebook friends a user has. They also describe the behavior of “social searching” versus “social browsing” and question whether Facebook members are “using the site to make new online connections” (social browsing), “or to support already existing offline connections” (social searching). Their research shows that most Facebook participants, up to the point of their study, use the site to maintain or rekindle established relationships [22]. We note that this behavior might now be continuing to evolve as the popularity of social networking sites grows. Ellison and colleagues [8] have considered how social capital relates to the use of Facebook, finding that use correlated with three different types of social capital, with the strongest correlation being the extent to which participants felt they belonged to their university communities. Joinson implemented a “uses and gratifications” framework to study what users enjoy about Facebook, and what motivates participation, finding an association between frequency of use and social connection gratification, and an association between increased time spent on Facebook and content gratification [18].

In the research we report on here, we consider features of interaction in a group on a social networking site that

emerged during non-routine, emergency conditions. We connect features of online social phenomena to understandings of crisis response social activity. As forums where millions of people already participate, social networking sites serve as a ready staging ground for quick response activity during the intense and emotional hours after a crisis occurs. Such sites are not only put into use by those who frequent them, they also can be discovered as new places for gathering and information retrieval during times of crisis [30, 40] where familiar communication tools are extended beyond their typical uses [28, 35].

### **RESEARCH ACTIVITIES**

We examined online interaction that occurred in a high-membership group on a popular social networking site—hereby denoted in this paper for research reporting purposes as “SNS”—in the aftermath of two recent tragedies that occurred as a result of violent crime at two US universities. Our focus is on the consequences of the aftermath behavior of the second emergency, given the precedent of the first.

### **The Emergency Events**

The first happened at Virginia Tech (VT) on the morning of April 16, 2007 in the town of Blacksburg, Virginia. A single shooter killed 32 people and injured many others at two separate campus locations over a two and a half hour time period before committing suicide. Ten months later, on the afternoon of February 14, 2008 at Northern Illinois University (NIU) in the city of DeKalb, a single shooter killed 5 students and injured many others in a campus lecture hall before taking his own life.

We report elsewhere on a larger set of descriptions about public-side information dissemination issues in the VT tragedy [30, 40]. We summarize a subset of that behavior here to prepare for discussion of SNS interactions during the NIU event, because it was also a site of notable emergency-related social convergence. We consider how the experiences of VT served as precedents for SNS behavior in the NIU event.

### **“Quick Response” Research Methods**

Performing data collection immediately following a disaster impact event helps capture *ephemeral data* [37] that quickly disappears during times of rapid social change. Known as *quick response research* (QRR) [34] we used both field and online data gathering techniques after both the VT and the NIU events. A standing human subjects approval for studying issues of information dissemination and technology use in crisis events that was then modified and approved for these specific events expedited logistics.

In the VT case, two members of our research team traveled to Blacksburg, VA five days after the event to conduct interviews that focused on information generation and dissemination activities by the university students on the day of the shootings (see [30] for detail and findings). In the meantime, research team members at home monitored a number of online sites, with sampling and archiving of online communication becoming increasingly systematic as

the nature and scope of the event became clear. Our work on information dissemination activities for the Northern Illinois event was restricted to investigation of interaction within SNS, with an eye to examining similarities and differences of social networking site behavior with the Virginia Tech case. Because SNS was the site for some new and remarkable widescale interaction in the VT event, we turned immediately to this forum in the aftermath of the NIU shootings. In both cases, our selection of SNS groups for discourse analysis was formulated around indications of high activity (membership size and posting frequency) and information exchange that included, but also went beyond, the highly pervasive memorialization activity. Although many communication forms populate the SNS environment, we constrain our focus to the textual communication as a sample of the larger online discourse about public support during emergency conditions. The analyses and reporting were conducted within a two month time-frame of the NIU event, also in keeping with “quick response” goals of research in the rapidly changing arena of ICT-supported emergency activity.

In the accounts and data reported here, times are local to the time zones where the emergency events took place using a 24-hour clock. For anonymization, group names have been given pseudonyms, and the text in data excerpts has been altered from the original, but with an effort to retain tone and style of writing. The affiliations by SNS participants are specified at the end of the data excerpts as VT, NIU, Nearby or Regional University, or Other.

### **The Social Networking Site**

SNS allows anyone to join and provides a place for multiple connections and networking opportunities to flourish. Within SNS, it is possible to invite others to join, and to become “friends.” Those friends can in turn invite others, thereby growing personal social networks at a seemingly exponential rate. In 2007, SNS was still largely known for its popularity among college-age people, though since September 2006 anyone has been able to join, and SNS no longer required academic affiliation [18]. In 2008, SNS participation has spread beyond the undergraduate college community in a form of “viral growth” [18]. Members maintain public “profiles” that serve as sites for interaction with others. They can also join “groups,” which can be created by anyone, to discuss topics or simply demonstrate through their membership a common interest or shared concern. Within SNS, there are multiple ways to post information. “Walls” are places for posting messages that can exist in both a user’s profile as well as in groups. Users can also post information to their own walls for others to view. Groups also house threaded discussions in addition to photos and other visual imagery.

### **FEATURES OF ONLINE ACTIVITY DURING THE EVENTS**

We summarize findings of online collective behavior following the Virginia Tech event to set the stage for the main focus of this paper: the examination of the rapidly

expanding role of widescale online interaction in post-event crisis response within the context of historical precedent.

### **Distributed Problem-Solving After the VT Event**

The tragedy at Virginia Tech happened on a Monday morning, when two people were killed during a first shooting that occurred at approximately 07:00 EDT, and an additional thirty were killed during a second shooting that occurred between 09:30-09:50. Students, staff, and faculty were told to stay indoors as the crisis was unfolding, but it took some time before the scale of the tragedy could be known and communicated. During this time, much of the information dissemination activities were happening within the campus community itself, once initial safety and welfare checks between students and their families were made. When VT officials held a press conference around noon to announce that at least 21 people were confirmed dead and 28 injured, information seeking activity around the event shifted to include a remarkable, highly distributed collective problem-solving effort.

Using web sites (social networking sites, news media sites, wikipedia and others) that became focal points for this converging information, members of the international public began trying to determine the victims of the shootings. People reported personal knowledge of the event; searched for and collated others’ knowledge from different sources; and made inferences based on people’s communication activity or inactivity. As an instance of *collective intelligence* [15] where a large, widely distributed group of people converge to problem-solve, the processing power was remarkable and allows new consideration of how *distributed cognition* [17] occurs on a new social scale.

When VT confirmed the fatalities at 32 plus the shooter at 14:13, the newly defined collective problem-solving space was constrained. Between specific SNS groups as well as other sites and news outlets that served as feeders, people worked together to determine the identity of the victims. Among the list-building activities we studied, we found that though no one single list was complete by the time VT released all 32 names, the total compiled information across all lists we analyzed was a correct identification of the 32 victims. Furthermore, the discoveries of the names were not in the same order across lists, evidence that the phenomenon of distributed problem-solving occurred in multiple places in parallel.

The problem-solving activity period closed when university sources released all of the names of the deceased at 21:17 on April 17, confirming the results of the collective problem-solving activity. A partial set of names was released earlier at 04:07, and a second set at 19:15, but the public-side identification of victims still precedes these announcements. Participants in the list-building activities self-policed; accuracy, verification, and gravitas ruled the interaction on these focal point sites.

### **Overview of SNS Activity During the NIU Event**

The first SNS group devoted to the NIU shootings was

## Group Membership Rate for "First NIU" 2/14/08 - 2/23/08

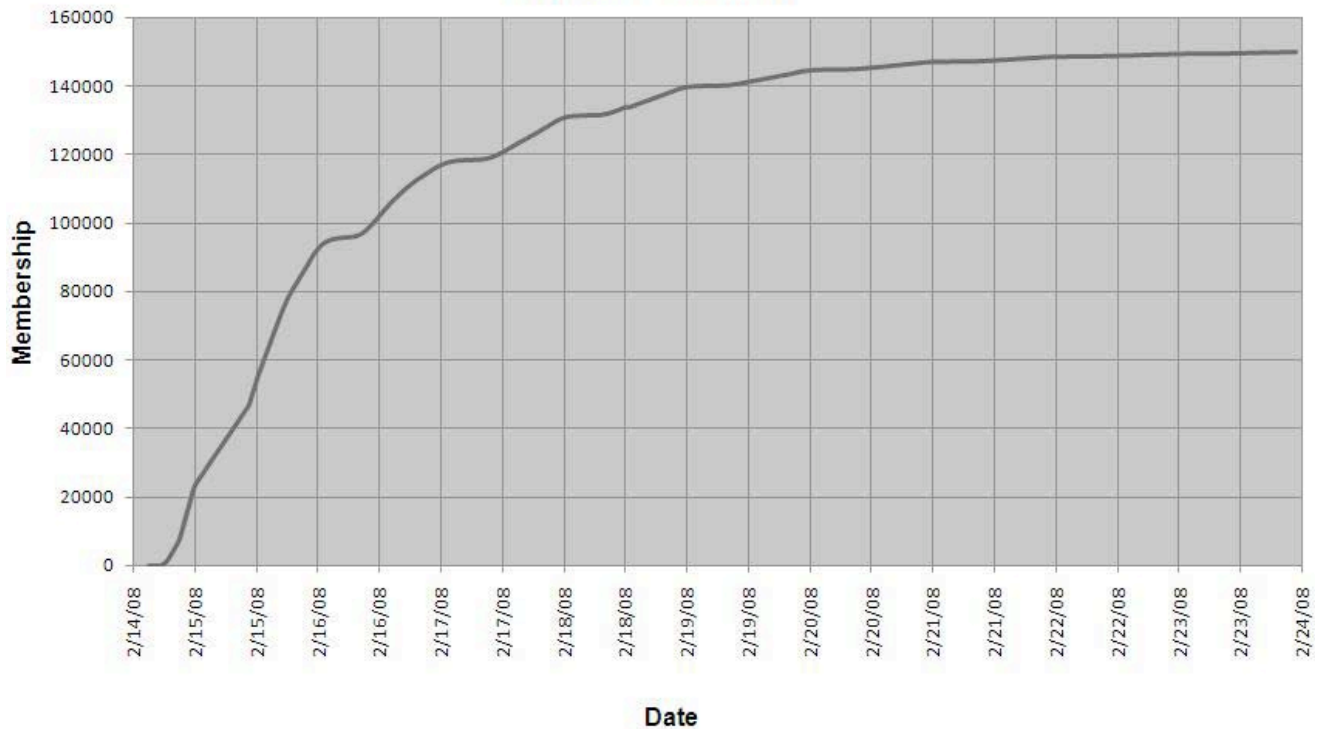


Figure 1. Membership gains over the first two weeks for the *First-NIU* SNS group.

created with the purpose of offering support to the NIU community, and began about 1.5 hours after the shootings that occurred at approximately 15:06 CST. We began monitoring this group— what we refer to here as *First NIU*— immediately, and took note of membership size, number and nature of wall posts, member profile information, and discussion topics (Fig. 1).

Membership in this group grew quickly, and reached over 24,000 by 23:00 on February 14, about 8 hours after the event. Approximately one full day later, membership reached 50,000, and by February 24, the group reached over 150,000 members and continued to hold steady. *First NIU* remained our main focus of study for the NIU case of several groups we observed.

People inquired about friends and loved ones in the hours following the shootings, though not often by name, and often as an expression of worry or frustration about not knowing more. In addition to welfare checks, memorialization activity and offerings of condolences accelerated once the number of victims was known and names were officially released.

During those first hours, we saw some attempts at determining the victims' names, which was similar to what happened in the VT case, though not the same widespread

collective problem-solving work was put to the task. The NIU crisis had fewer fatalities, and so the need to fill the information gap was of a different scale. But our examination of the activities on *First NIU* suggests an additional reason for these differences: that of historical precedence. The Virginia Tech event served— tragically— as a preceding condition to the NIU case, particularly in the form of example-setting for how to behave and what to do in an online setting in emergency crisis situations that attract broad interest.

VT participation in *First NIU* is notable due to its presence and nature, with VT students frequently expressing support, offering advice, and noting the connection between the two universities. On the group wall, a total of 3,347 posts were made during the first 9 days of the event by which time posting tapered off. Of these, 514 were from NIU students and 112 were from VT students. Other than those participants who were from the regional “Chicago network,” VT affiliations had the greatest representation as measured by wall post contribution. Though the number of VT participants is comparatively small to the total number of VT students who *could* have posted, the convergence of activity in the form it took on this site can serve as an indicator of the ways widescale interaction will support emergency-based participation in the future.

The design of SNS groups is such that the wall is the most readily visible means for posting public messages. Though there were several discussion threads within *First NIU* on various topics, including VT offering NIU support, most of the interaction happened on the group's wall, which comprised three times the number of posts as the total of discussion posts. Though we examined the discussion threads as well (and report on some of this data) the analysis focuses primarily on wall posting activity. Wall posts were collected and analyzed, coding behaviors around what emerged as the highest-order themes of problem solving, shared experience and offering of support/advice becoming apparent and increasingly analytically refined.

#### HOW WIDESCALE INTERACTION SUPPORTS POST-EVENT SELF-ORGANIZING ACTIVITY

The public response to crisis events into today's network world is further expanding an already well-recognized and internationally-occurring phenomenon of significant social convergence behavior in the aftermath disaster events [14, 19]. The broad convergence of people into the disaster space can be seen as having parallel activity online, though more investigation to understand these new phenomena is needed [16].

Events of widespread consequence and interest instigate rapid social convergence in these online settings as well. History-making events have always drawn vast audiences (especially in the era of television) as referenced for example, by the American cultural touchstone "Where were you when heard John F. Kennedy was shot?" question. But in today's networked world, the means for learning about and discussing surprising, significant, non-routine events can now also be found in digital space.

When those online destinations are in the form of "social networking" sites, they set the stage for highly extended participation in ways that are only recently possible because of the numbers of people they draw. Social networking sites offer the opportunity for *widescale interaction*. Increasingly, people congregate onto and through social networking sites simply by virtue of their interest in interacting with others in their sometimes vast social networks. Whereas we might have characterized earlier forms of computer-mediated interaction as mostly organized around specific interests, goals, or topics of concern for which people had to more explicitly pursue belonging and membership (even if free and simple to achieve), social networking sites begin as places to gather, where people can—and do—easily organize around any number of topics and interests.

When social networking sites become the destinations for learning more about an emergency event, new opportunities for finding and providing information become present, as do relationships that might not have otherwise existed between people who have had similar experiences. In this section, we describe central aspects of the post-emergency activity in this environment of widescale interaction.

#### Sensemaking

When people converge onto the geographical site of a crisis or disaster event, it might be for any number of reasons. People come to help (in both official and unofficial capacities); to return after evacuating; to support emergency workers; to memorialize; and, often, out of curiosity (though they then often become volunteers of some sort). Social convergence is a form of collective behavior that describes the kinds of self-organizing activities of the public [14, 19, 41].

In our analysis of SNS groups that were created in response to the NIU emergency, early activity shows a mix of participation by those who had some direct relationship to the event, including those expressing shock as well as support. For this and the VT emergency, this newly converged, vast audience becomes an opportune place for those in direct need of information to seek it. Some posts (which we have chosen not to repeat here because the grief was so palpable and personal) were from a close relative of someone injured in the NIU shootings who was seeking witnesses to the event so that he could learn more information. In the VT case, we found similar instances of acts that were *desperate moves* to find information after all other avenues had been apparently exhausted [40]. Others, such as the following, were from friends who knew people on the NIU campus, and were seeking information about their welfare, which also happened extensively in the VT event:

If anybody knows information about the victim's names please let me know. I can't get in touch with some of my friends. (Regional university student)

What we see then, is that as these places of online convergence become opportunities for information finding and perhaps even very focused, goal-oriented distributed problem-solving activity, they then become the means by which an extended, curious and commiserating audience *also* makes sense of the event. These sensemaking activities may at first seem intrinsically individual and personal. For example, the public stage provided by SNS became a destination for those wishing to give accounts of the surreal "near-miss":

I just thank God I skipped class today- I would have been in <the lecture hall> at 3:00 when it happened. (NIU)

The extended audience is witness to these early, immediate pleas for help and displays of disbelief by those who are more directly connected to the event. Such posts relate to the early stages of sensemaking [41], during which "phenomena have to be forcibly carved out of the undifferentiated flux of raw experience and conceptually fixed and labeled so that they can become the common currency for communication exchanges" [7]. On the one hand, we might think of this relationship as voyeuristic; on the other, it is that seeming need for visceral connection

that enables empathy. Furthermore, for events that have cultural and (the likelihood of) historical significance, this connection is also the basis for sensemaking on a much larger social scale.

### **Alliance**

In the NIU situation, the massive but focused online audience created by the symbiotic relationship between individual and collective needs in crisis response in turn created the conditions for members of two communities that experienced similar tragedies to directly connect. SNS served as conduit by which members of these institutions could pursue this connection through discursive exchange.

We think of this as CMC-enabled alliance. Showing some similarities to activities that characterize communities of practice [24], the alliance here has features of learning, instruction, and guidance. VT students, having experienced similar tragedy so recently, are in a position to offer empathetic support and counsel to NIU students, in ways that no others really can, particularly with respect to how best to conduct oneself in the context of the emergency in online settings. In that sense, a fledgling “practice” is shared but born out of need, with a lifespan that one expects, or at least hopes, to be short. A point of contrast where a habitual practice around crisis is indeed in place occurs around seasonal natural hazards events. Whereas “hurricane country” or “wildfire country” are the places where geographical communities learn to rely on its members for cooperative help over time, the erstwhile unrelated communities of VT and NIU are only newly united in crime-related crisis that has no predictable pattern in space and time. Were it not for online arenas for massive convergence like SNS, the names of their institutions would be connected principally through the comments and writings of newscasters and journalists.

Instead, social networking sites allow for peer-to-peer activity to become a basis for sensemaking, which in turn enacts the relationship between the two institutions. SNS communications are not merely cursory activities that result from the connection between NIU and VT; they help to *create* that connection. The environment of the SNS group allows big, anonymous, university-sized audiences to find a way to communicate peer-to-peer.

### **Empathy**

We see this alliance enacted through different kinds of postings. The first VT student to post on the *First NIU* group wall was at 17:42, approximately 4.5 hours after the shooting event, after which point, many more VT-affiliated posts began to appear. VT students frequently expressed support and noted the connection:

This brings back horrible memories.  
Hokies are praying for you. (VT)

Some VT students appeared to post out of responsibility or need to offer sympathy through their empathetic understanding, as expressed here:

After last april, we didn't want anybody else to have to feel the pain we endured. We are praying for you and will do anything to help you through this, as you did for us, and still means so much to us today. We got your back (VT)

I just wanted to say that I love all you guys even though I don't know you. I am a junior at Virginia Tech and I had a class in Norris Hall and I can honestly say that I know EXACTLY how you feel. If you need someone to relate to, I know I speak on behalf of the Hokies when I say that we are here for you!!! (VT)

Posts such as these by VT students indicate emotional connection and acknowledgement of common experience. In addition to bringing attention to the link between the universities' students, this last VT student focuses on her particularly empathetic position by explaining that she “had a class in Norris Hall,” the campus building where 30 people were killed, which permits her to say she knows “EXACTLY” how the NIU students feel.

Also, some NIU posters note that the support from VT is particularly meaningful:

Thanks to all the Virginia Tech students writing in. Your thoughts & prayers are much appreciated. (NIU)

Thank you everybody. Especially thank you students of Virginia Tech. I could never image your pain that day, but now I feel I might see things the way you saw them. Hokies and Huskies forever. Brought together in tragedy, united in faith. (NIU)

### **Caretaking**

In addition to the words of support, many VT students felt it necessary to “do more.” To this end, one VT student created an SNS group (*VT-NIU*) whose purpose was for VT students to broadly but personally communicate with NIU students through SNS. As the creator says in the “Group Info” section:

I think this is a good idea that enables us to show our support for the community and what they are going through. (VT)

The idea of “enabling” is notable here, referring apparently to the nature of SNS as one that “enables” the VT community to come together and show what is being communicated as unified support.

In addition to *VT-NIU*, VT students also had a discussion on another SNS group that centered around ideas for showing support to NIU:

Hey guys, I am starting this thread to get ideas from the student population

as to what we can do to show our support beyond a simple <SNS> group. Signing banners and flags is an idea, but we are open to suggestion. Right now we have members of Student Government as administrators so we can turn your ideas into actions. Let's hear it. (VT)

This is a call for the VT student community to “do more” than post messages of support on public SNS walls. Another VT student offers her idea, which is similar to the purpose of *VT-NIU*:

Personally, I have been choosing random people in the NIU network and sending messages. I've gotten a response back so far thanking me for the support. Others did this for me last April and it meant a lot. (VT)

Another notable wall post on an additional support group that centers on the relationship between VT and NIU is by the father of a victim from the VT shooting who identified himself as such when he offered support to the NIU community. He wrote of his wish for others to not have to “walk down the road we have traveled,” and to “know that you will not ever be alone.” Though we do not know if other parents of VT victims went to SNS after the NIU tragedy, this parent’s use of the public stage offered by SNS illustrates a strategy for widely dispersing support and condolences to a nevertheless small and particular set of people.

#### *Guidance & Instruction*

The allied relationship between VT and NIU is further enacted through requests for and offers of guidance. The post that follows does not list an affiliation, but the content indicates the participant is or was from VT:

Back in April I had trouble making or receiving calls for a day and a half. For now, don't panic. Phone lines will be busy for a while, and keep trying to call of course, but try using the internet for contact as well. I hope for the best. (No Network)

Some posts from VT students are also instructive, particularly with respect to behavior in online settings:

It sucks learning that people died over <SNS>. Please do not post names. (VT)

In the VT crisis, one of the first in the age of SNS, one of the organizing topics was a discussion—a careful, respectful, emotional discussion—to identify the names of the fatality victims. The act at large was done in response to explicit requests, but also out of a simple desire to help, but the consequences for some was nevertheless painful.

The media attention that VT received was also the basis for additional instruction to NIU students here:

One thing I can say is that the media is going to pressure everybody for stories, details, names, and thoughts. DO NOT TALK TO THEM! It will only make the whole situation more difficult. (VT)

I know everybody feels differently about it, but with what the media put us through last year, I implore you NOT to look at pictures, videos, and other info on the websites. Not because you and we don't care, but because we remember how it feels to be in shock and grieve and have cameras in our faces. Our thoughts are with NIU. (VT)

Warning about the intense outside attention, coupled by direct experience of that phenomena itself, set the stage for the next phase of crisis-related online behavior, that of retreat from the large audience, while still using the audience to the greatest advantage.

#### **Retreat: Regaining Control in a Public Setting**

Participants are aware of the highly public and accessible nature of SNS—it is why so many turned to and used it as a communication medium in the aftermath of the shooting. However, participants were also aware of the precarious position they were in by using SNS to relay and garner information. What follows is a discussion about the use of SNS as a device to gather information, while working within the developing ethos around managing conduct in a public sphere.

Within the *First NIU* group, a discussion whose purpose was to find out who the victims were began with this post:

If anyone knows information about the victims' names please let me know. I cannot get a hold of some friends (Regional university student)

A bit later, within the same discussion thread, we read:

<...> I got in contact with a lot of my friends but not all. It is eating at me not knowing what is going on. How do you sleep not knowing if all of your friends are alive? (Regional high school student)

To which an NIU student responds:

Rely on your friends who go here to tell you. I know three names but I'm not going to post them. (NIU)

This last discursive move suggests that naming victims on SNS might not be considered acceptable by this community. Approval of such a standpoint is further bolstered in a response posted five minutes later within the same discussion thread:

Victims' names shouldn't be released on <SNS>. The media will have a field



day with such information. Please be respectful to the families and friends of the victims. More information should be publicly available tomorrow. (Other)

Though there are information-seeking and emotional benefits to be found with large, rapidly converging online audiences, the publicity of those environments also can constrain behavior. SNS participants were likely aware of the publicly available nature of posted information, yet still chose to use SNS as one means of learning about the status of friends and loved ones but in a way that retained a degree of privacy [27], as the following posts illustrate:

I hope that all my friends are ok, I've been trying to get a hold of some of you, but the phone towers are down. Please call me, <SNS> me or AIM me to let me know you're ok! (Regional university student)

I just heard about this and I'm praying for all those affected. I have a friend at NIU - I hope she is okay!!!!!!! (Other)

The participants who posted these messages are not from NIU, but turned to SNS as a way of reaching NIU friends. No names are given, other than those of the posters. By not using specific names, these participants are making a "publicly private" plea as well as casting a wide net in what is probably a large and loosely-connected social network. We view this online behavior as an instance of how to manage the "burdens of responsibility" that technology use implicates [26, p. 38].

However, later on, within the discussion where the purpose is to find out who the victims are, we see instances of people still searching for information about specific NIU students. One participant from a non-NIU university posts:

I am worried about my brother. His initials are <xx>. (Other University)

In addition, an area high school student posts:

If anyone knows a girl (class of <20XX>) with initials <xx> please let me know if she is ok. I'm worried about her. (Regional High School Student)

Here we see the continued use of this discussion to determine names of casualties. A practice of listing only initials rather than full names emerges as another strategy for polling a large audience for specific information while maintaining a degree of privacy. We take this as an indication of cautious behavior in the interest of respect for the privacy of NIU students and families, which is different than much online discussion following the VT tragedy, perhaps in response to the precedent set.

## DISCUSSION

This research brings attention to the way social networking sites, as virtual destinations that create the opportunity for widescale interaction, support crisis-related response, both for people more directly affected by and seeking information about the emergency, and for peripheral participants attempting to make sense of the newsworthy event. The relationship between these two groups is symbiotic, where appeals for specific information are fielded by a large audience that in turn uses these requests as a means for collectively making sense of the event.

Furthermore, in the cases of the VT and NIU tragedies, this vastly public forum enabled connection between two universities as realized in student relationships and peer interaction, in turn creating an opportunity for instruction and sharing of experience. Alliance between the two universities as facilitated by peer relationships is a striking characteristic of this emergency event if not for its vastness but rather in the demonstration that institutional connection can go beyond regional proximity and executive level cooperation to that orchestrated at the student level.

The helping relationships that form in response to need in times of disaster [3,13] are demonstrated here again, but under highly geographically distributed circumstances where institutional affiliation has particular significance. By virtue of using SNS, participants (almost always) display their "networks," which in the case of NIU and VT students, is their university affiliation. This information supports intersubjective knowledge of the connection between members of the two universities, which in turn created the means for expressing not only empathy but also sharing knowledge about how to best behave and cope in a highly public online setting.

In this highly public setting, many closest to the NIU event came to create more closely circumscribed boundaries around sensitive issues as time went on and to a seemingly greater degree than in the VT event, which was the first university school shooting that took place after the launch of SNS in an English-speaking country. Though features of the events did differ in ways that could also influence the consequences of online behavior, the precedent of the VT event seems to have influenced online activity in the NIU case. In the case of VT, the problem-solving activity sprung up spontaneously as a result of the widespread safety-and-welfare checking activity. And, importantly, it would seem that no one expected that such activity would garner considerable notice; it was a bottom-up, highly distributed, unorchestrated activity, without precedent to guide and constrain it. In fact, the SNS activity that took place in the aftermath of the VT shooting set the precedent. In the NIU event, it could be that this precedent served as an impetus to purposefully *not* implement activities such as the list-building that occurred in the VT situation.

It remains to be seen how information dissemination about victims in crisis events will take shape in future emergency

events. However, we expect that today's behaviors in the popular social networking environments will shape the establishment of future online behavior and be organized around specialized genres [2, 9] of computer-mediated discourse that emerge to guide the urgent information seeking, vast attention and high volunteerism that emerge in such situations.

### Conclusion

The ideas of social creativity [12] and collective intelligence [15] are becoming increasingly powerful because they are now being realized in different and more visible forms. In emergency events where large numbers of people are affected, even larger audiences are required to assist. In disaster and emergency situations, rapid online social convergence means rapid social ordering as well, such that activities of seeking and offering of assistance and the forging of empathetic alliance can, on the one hand, occur and, on the other, continue to viably exist while in the public eye. These are some of the mechanisms involved in widescale interaction, which describes the potential for broad, immediate, and varied participation that the conditions of online forums, and social networking sites in particular, increasingly allow.

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### REFERENCES

1. Aguirre, B., Wenger, D., Glass, T., Diaz-Murillo, M. and Vigo, G. The Social Organization of Search and Rescue: Evidence from the Guadalajara Gasoline Explosion. *International Journal of Mass Emergencies and Disasters* 13,1 (1995), 93-106.
2. Bakhtin, M. *Speech Genres & Other Late Essays*. University of Texas Press, Austin, TX, USA (1986).
3. Barton, A.H. *Communities in Disasters: A Sociological Analysis of Collective Stress Situations*. Doubleday, Anchor Books, Garden City, NY (1970).
4. Boyd, D. Why Youth (Heart) Social Network Sites: The Role of Networked Publics in Teenage Social Life. In D. Buckingham Ed., *Youth, Identity and Digital Media*, MIT Press, Cambridge, MA (2007).

5. Boyd, D. Social Network Sites: Public, Private, or What? *Knowledge Tree*, 13 (2007), 1-7.
6. Bødker, S. When second wave HCI meets third wave challenges. In *Proceedings of the NordiCHI 2006*, ACM Press (2006), 1-8.
7. Chia, R. Discourse Analysis as Organizational Analysis. *Organization*, 7,3 (2000), 513-518.
8. Ellison, N. Steinfield, C. and Lampe, C. The benefits of Facebook 'friends': Exploring the relationship between college students' use of online social networks and social capital. *Journal of Computer-Mediated Communication*, 12, 4 (2007), 1143-1168.
9. Fairclough, N. *Analysing Discourse: Textual analysis for social research*. Routledge, London (2003).
10. Farnham, S., Cheng, L., Stone, L., Zaner-Godsey, M., Hibbeln, C., Syrjala, K., Clark, A. M., & Abrams, J. HutchWorld: Clinical Study of Computer-Mediated Social Support for Cancer Patients and Their Caregivers. *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, ACM Press (2002), 375-382.
11. Farnham, S., Pedersen, E., & Kirkpatrick, R. Observation of Katrina/Rita Groove Deployment: Addressing Social and Communication Challenges of Ephemeral Groups. *Proceedings of the Conference on Information Systems for Crisis Response & Management (ISCRAM)* (2006).
12. Fischer, G., Giaccardi, E., Eden, H., Sugimoto, M., & Ye, Y. Beyond Binary Choices: Integrating Individual and Social Creativity. In Edmonds, E.A. and Candy, L., Eds. *International Journal of Human-Computer Studies (IJHCS) Special Issue on Computer Support for Creativity* 63,4-5 (2005), 482-512.
13. Fritz, C.E. Disaster. In Merton, R.K. & Nisbet, R.A. Eds. *Contemporary Social Problems*, Harcourt, Brace, and World, Inc., New York, NY, USA, (1961), 651-694.
14. Fritz, C.E., & Mathewson, J.H *Convergence Behavior in Disasters: A Problem in Social Control*. Committee on Disaster Studies. Disaster Research Group (1957).
15. Hiltz, S.R., & Turoff, M. *The Network Nation: Human Communication Via Computer*. MIT Press, Cambridge, MA (1993).
16. Hughes, A., Palen, L., Sutton, J., Liu, S.B., & Vieweg, S. "Site-Seeing" in Disaster: An Examination of On-Line Social Convergence. *Proceedings of the Conference on Information Systems for Crisis Response & Management (ISCRAM)*, (2008).
17. Hutchins, E. *Cognition in the Wild*. MIT Press, Cambridge, MA, (1995).
18. Joinson, A.N. 'Looking at', 'Looking up' or 'Keeping up with' people? Motives and Uses of Facebook. In *Proceedings of Conference on Human Factors in*

- Computing Systems (CHI)*, ACM Press (2008), 1027-1036.
19. Kendra, J. M., & Wachtendorf, T. Community Innovation and Disasters. In Rodriguez, H., Quarantelli, E.L. and Dynes, R.R. Eds., *Handbook of Disaster Research*. Springer, New York, (2006) 316-334.
  20. Kollock, P. & Smith, M. Managing the Virtual Commons: Cooperation and Conflict in Computer Communities. In Herring, S. Ed. *Computer-Mediated Communication*. John Benjamins, Amsterdam (1996).
  21. Kreps, G.A. *Social Structure and Disaster*. University of Delaware Press, Newark (1989).
  22. Lampe, C., Ellison, N. & Steinfield, C., A Face(book) in the Crowd: Social Searching vs. Social Browsing. In *Proceedings of the Conference on Computer-Supported Cooperative Work*, ACM Press (2006), 167-170.
  23. Lampe, C., Ellison, N. & Steinfield, C., A Familiar Face(book): Profile Elements as Signals in an Online Social Network. In *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, ACM Press (2007), 435-444.
  24. Lave, J. & Wenger, E. *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press, Cambridge (1991).
  25. Liu, S.B., Palen, L., Sutton, J., Hughes, A. & Vieweg, S. In Search of the Bigger Picture: The Emergent Role of On-Line Photo Sharing in Times of Disaster, *Proceedings of the Conference on Information Systems for Crisis Response & Management (ISCRAM)*, (2008).
  26. Nardi, B. A. & O'Day, V. L. *Information Ecologies: Using Technology with Heart*. MIT Press, Cambridge, MA (1999).
  27. Palen, L. & Dourish, P. Unpacking "Privacy" for a Networked World. *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, ACM Press (2003), 129-136.
  28. Palen, L., Hiltz, S.R., & Liu, S.B. Online forums supporting grassroots participation in emergency preparedness and response. *Communications of the Association of Computing Machinery*, 50,3 (2007), 54-58.
  29. Palen, L. & Liu, S. Citizen Communications in Disaster: Anticipating a Future of ICT-supported Public Participation. In *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, ACM Press (2007), 727-736.
  30. Palen, L., Vieweg, S., Sutton, J., Liu, S.B., & Hughes, A.L. Crisis Informatics: Studying Crisis in a Networked World. In *Proceedings of the Conference on e-Social Science (e-SS)*, (2007).
  31. Pfeil, U. & Zaphiris, P. Patterns of Empathy in Online Communication. In *Proceedings of the Conference on Human Factors in Computing Systems (CHI)*, ACM Press (2007), 919-928.
  32. Preece, J. Empathy Online. *Virtual Reality*, 4,1 (1999), 74-84.
  33. Preece, J. *Online Communities: Designing Usability, Supporting Sociability*. John Wiley and Sons. Chichester, England (2000).
  34. Quarantelli, E.L., The Disaster Research Center (DRC) Field Studies of Organized Behavior in the Crisis Time Period of Disasters. In Stallings, R.A. Ed. *Methods of Disaster Research* (International Research Committee on Disasters) (2002), 94-126.
  35. Schneider, S.M. & Foot, K.A. The Web After September 11, in Rainie, L., Schneider, S.M. & Foot K.A., Eds. *One Year Later, September 11 & the Internet, Pew Internet & American Life Project Report* (2002).
  36. Stallings, R. & Quarantelli, E. Emergent Citizen Groups and Emergency Management. *Public Administration Review*, 45 (1985), 93-100.
  37. Sutton, J., Palen, L., & Shklovski, I. Back-Channels on the Front Lines: Emerging Use of Social Media in the 2007 Southern California Wildfires. In *Proceedings of the Conference on Information Systems for Crisis Response and Management (ISCRAM)* (2008).
  38. Tierney, K.J., Lindell, M.K., & Perry, R.W. *Facing the Unexpected: Disaster Preparedness and Response in the United States*. Joseph Henry Press, Washington, DC (2001).
  39. Torrey, C., Lee, M., Burke, M. Dey, A., Fussell, S., & Kiesler, S. Connected Giving: Ordinary People Coordinating Disaster Relief on the Internet. *Proceedings of the Fortieth Annual Hawaii International Conference on System Science (HICSS)* Computer Society Press, (2007).
  40. Vieweg, S., Palen, L., Liu, S.B., Hughes, A.L. & Sutton, J. Collective Intelligence in Disaster: Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shooting. *Proceedings of the Conference on Information Systems for Crisis Response & Management (ISCRAM)*, (2008).
  41. Weick, K., Sutcliffe, K. and Obstfeld, D. Organization and the Process of Sensemaking. *Organization Science*, 16,4 (2005), 409-421.