CITIZENS' COMMUNICATION HABITS AND USE OF ICTs DURING CRISES AND EMERGENCIES

Matti Haataja
The Agora Center,
University of Jyväskylä, Finland

Jenni Hyvärinen
The Agora Center,
University of Jyväskylä, Finland

Anne Laajalahti
Department of Communication,
University of Jyväskylä, Finland

Abstract: *In this article, citizens' communication habits and use of information and communication technologies during crises and emergencies are discussed from the perspective of community resilience. The topic is approached qualitatively by exploring citizens' perceptions, and the data were gathered by means of focus groups in storm-prone and flood-prone areas in Finland. The results indicate that citizens consider emergency communication to be mostly unidirectional: from authorities to the public. However, because crises are often complex and fast developing, cooperation among response organizations and citizen groups is needed to coproduce safety and in adapting to changing situations. Organizations wanting citizens to participate proactively in emergency management should raise citizens' awareness of the means and possibilities to contribute, because these informants' expectation that authorities would welcome their input was low. Based on the results, public participation could be supported further by credible actors, such as local volunteer organizations.*

Keywords: *citizen participation, emergency communication, information and communication technology.*

INTRODUCTION

During crises and emergencies, citizens use various channels and methods to communicate and to receive information from authorities and each other. During recent years, citizens have been making increased use of social media to communicate about crisis- and emergency-related events. By definition, social media platforms are interactive, and thus they enable everyone interested to shift between the roles of consumer and producer of information (Currie, 2009).

This is convenient because public crises create not only the need for information, but also the need to interact and share opinions with other citizens (Sutton, Palen, & Shklovski, 2008). From the citizens' point of view, arguably the main function of social media in times of crises is to serve as an additional source of information and a way to share information. However, as noted by Reuter, Heger, and Pipek (2013), rather than actively contributing by creating or sharing information, the majority of social media users are readers. As such, they simply consume and acquire information for their own purposes in order to develop general situational awareness and to obtain information regarding possible instructions and protective measures. Also, traditionally, the direction of emergency communication has usually been from authorities to the public. In this sense, it is hardly surprising that nowadays, even though there are other possibilities, the majority of crisis and emergency management organizations that use social media use it mainly as a one-way dissemination tool, as an additional channel complementing traditional channels such as radio and television (e.g., Currie, 2009; Lindsay, 2011, p. 1).

Because crises are often complex and fast developing, the problems created by crises cannot always be solved by crisis communication and management experts alone. Thus, successful emergency management necessitates cooperation among various organizations in the response network, as well as between response organizations and citizen groups. The inclusion of ordinary citizens, citizen groups, and communities into the crisis preparedness and response network—known as the "whole community approach"—has been proposed by many scholars (e.g., Helsloot & Ruitenberg, 2004; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008) and by practitioners (e.g., Federal Emergency Management Agency [United States of America; FEMA], 2011; United Nations International Strategy for Disaster Reduction, 2011). Included in the whole community approach are response organizations, other relevant organizations, and citizens as coproducers of information in the crisis and emergency management system (FEMA, 2011). Although the need for "collaborative resilience," the ability to be resilient and cope with crises through collaboration between organizations and citizens (Goldstein, 2011), has been identified, few studies have concentrated on elaborating what motivates citizens to contribute and participate in crisis preparation and response. Furthermore, because the currently available information and communication technologies (ICTs), such as applications of social media, enable citizen participation, we seek in our research to deepen understanding on how the relevant ICTs can be used to facilitate the participation of citizens in collaborative resilience and on how that participation could be supported by crisis and emergency management organizations.

Individual citizens can be viewed as having different types of roles in crises and emergencies. First, everyone is interested in his or her own well-being, safety, and security. To this end, individuals use various channels to obtain information. Lately, the use of social media as a means for communicating about crises and emergencies has received much attention (see, e.g., Beneito-Montagut, Anson, Shaw, & Brewster, 2013; Goolsby, 2010; Hughes & Palen, 2009). Although an inseparable component of daily communication for some, the adoption of the most popular applications of social media vary across geographical areas and demographic groups (e.g., age groups). Despite its popularity, statistics show that nonadopters of social media exist even in more technologically advanced countries, such as in Finland, especially among older age groups (Finnish Broadcasting Company, 2013). Based on differences in the adoption of ICTs among individuals, we reasonably can assume that individuals will vary in preferred methods and channels for crisis and emergency

communication. Furthermore, preparedness should not be seen only from an individual perspective, but from a community perspective as well.

As mentioned above, we assume in this article that citizens take on a variety of roles in emergencies, perhaps as a volunteer in an organization or by participating informally. Besides personal well-being, individuals are interested in and concerned about the well-being of their family and friends. Even when the given event does not concern individuals personally or members of their immediate close circles, citizens in the affected areas are often willing and able to function on their own behalf to build up community resilience and help others when given the possibility (e.g., Helsloot & Ruitenberg, 2004). The purpose of this study is to elaborate on and build further understanding of how and via what ICTs citizens prefer to communicate in their different potential roles in crises and emergencies.

RESEARCH METHOD AND DATA COLLECTION

This study was conducted to explore and build further knowledge on (a) ordinary citizens' communication habits and their current use of ICTs in crisis and emergency situations and (b) the various communication needs citizens have and how well the potential new ICT solutions meet these needs. The aim was also to gain further insight into what solutions could match the existing communication needs of individuals and how the acceptance of relevant upcoming technology could be enhanced among potential future adopters.

The research task was approached qualitatively by eliciting ordinary citizens' descriptions of their (a) information needs, (b) information sharing activities, and (c) use of ICTs in crisis and emergency situations. We conducted three focus groups (see, e.g., Krueger & Casey, 2009; Liamputtong, 2011; Stewart, Shamdasani, & Rook, 2007) in Finland, 24–29 September, 2012.

Before gathering the research data, the discussion topics and questions were piloted in a test discussion among five recruited university students or staff members. The phrasing of discussion topics and questions were adjusted slightly based on the feedback received. In addition, the purpose of the pilot was to practice the timing and researcher roles and to set up and test the audio recording equipment. The pilot discussion was not included in the research data.

The participants for the focus groups were recruited through a multimethod process. Local community members were contacted via regional organizations, such as local branches of the Red Cross, volunteer rescue services, and local fire departments, which spread the word and promoted participation by forwarding an email invitation to take part in the research and by putting pamphlets to their noticeboards. Focus group sessions were announced in local newspapers, and the authors also recruited participants by handing out leaflets face-to-face in local library and shops. The objective was to form heterogeneous groups of males and females of different ages and backgrounds. Nevertheless, no specific demographic criteria were applied in selecting participants and all volunteers willing to take part in focus groups were included in one of the three sessions. Ultimately, 21 participants (15 females and 6 males) were recruited for the three focus group sessions, which consisted of six to nine participants with at least one man in each group. Participants were between 27 and 69 years old, with an average age of 52. Thus, compared to average age of the population

of Finland (40.1 years for men, 43.1 for women), the participants represented a somewhat older group of the public (Statistics Finland, 2013).

The focus groups were held in two locations: one in a rural area prone to and with a recent experience of intense storms and two others in a medium-sized city prone to and also with recent experience of flooding. However, the aim of the focus groups was not to compare the views expressed in the different sessions, but rather to hear a diversity of views while ensuring that each group of participants had enough in common to generate discussion from a community point of view. In addition to storms and floods, participants could describe their experiences related to other types of crises or emergencies. Around half of the participants (*n* = 10) had experienced personally a crisis or emergency situation. However, because all the participants lived in a storm-prone or a flood-prone area, they all had opinions and, based on the transcripts of the sessions, at least second-hand experiences on the topic. The participants seemed rather comfortable in taking part in the discussion topics.

All three focus group sessions addressed the same three discussion topics. The first concerned the information needs of citizens in crisis and emergency situations and from where they would seek or have sought information. A second topic concerned how, with whom, and via what ICT devices/services they prefer to share information and what future preferences they perceived having. The third discussion topic concerned the existing customs, preferences, and needs regarding the use of different ICTs during crises and emergencies. The role of the researchers was quite active, and specific questions were asked during all three focus group sessions.

At the beginning of each focus group session, we provided all the relevant information about the purpose of the session, its agenda, and about the research project itself. We then introduced and explained the roles of the researchers present in the session. Next, the participants signed the informed consent form and provided some background information regarding, for example, their previous experiences with crises, by completing a short survey. When the writing tasks were complete, we activated the audio recording equipment and the meetings continued with the participants introducing themselves before proceeding to the focused discussion. The sessions were held in Finnish, and all the participants were native speakers of Finnish. Each of the three group discussions lasted about 1.5 hours. The atmosphere was informal but focused.

Four researchers were present in each focus group, with each fulfilling a specific role in each session. One person served as the main moderator; she focused on the process, presided over the session, asked the questions, and kept the discussions on track. A second person was the assistant moderator, who verified that all the contents were addressed and asked impromptu questions if the group did not address some key points. He also took notes and kept track of time. A third person was the host or facilitator who ensured that everything went smoothly. She also monitored the audio equipment. A fourth person, hired to transcribe the data, kept a log of the speaking order of participants throughout the discussion.

The focus group sessions were audiotaped and transcribed in an anonymized way for data analysis. This resulted in 107 pages (35,789 words) of material for further analysis. The analytical method was a data-driven qualitative content analysis (see, e.g., Frey, Botan, & Kreps, 2000). The content was organized according to the themes, with attention on emerging subthemes. Although the data were analyzed as a whole, the three sessions remained

distinguishable to facilitate the in-depth analysis of the data and an understanding of the participants' experiences from a community approach.

RESEARCH FINDINGS

Citizens' Information Needs During Crises

In connection with the first discussion topic, the participants were asked to talk about what their information needs were/would be in order to cope with various crises, emergencies, or acute disruptive events. The participants also were asked to evaluate the subject from the perspective of their possible roles, specifically in respect to personal safety and situational awareness (a) as a parent or family member, (b) as an employee, and (c) as a member of the community.

On the topic of information needs, the desire and need to know the status of close family members and friends was discussed the most by the participants. Special consideration was given to individuals belonging to a potentially vulnerable group, such as elderly people and children. In line with the literature (e.g., Reynolds & Seeger, 2005), the participants also highlighted the need for communication to reduce uncertainties regarding the impact of a given event. Individuals preferred to know explicitly if the event or incident concerned them or their family and close friends. One participant described the need in a following way:

> *First thing to spring to my mind, especially now that I have small children [and] if I would not be with them, I would need to know how to reach them or somebody in their presence, by phone, to ensure everything is alright—or to know if the event or incident even affected my family in the first place*. (G3/P2)[1]

In relation to uncertainty, informants noted that although receiving relevant information is essential, it is equally important that the information is disseminated in a timely fashion. On this issue, the participants criticized authorities in prior crisis situations for being too slow in providing information to the public. In line with Veil, Buehner, and Palenchar (2011), the participants stated that even if the authorities do not have a comprehensive view on a given incident, they should communicate nevertheless with the public as rapidly as possible and provide regular updates in order to give the public the sense that the authorities are aware of the situation, that they are taking action, and that all citizens are being cared for. In other words, the participants were thinking that "*it would be better to hear at least something than to not hear anything*" (G2/P2), and that "*if it's a storm or something, it would be nice to hear every now and then at least the fact that the authorities don't know more, so you wouldn't have to think that they might be concealing something*" (G2/P4).

The participants also provided several concrete examples of the types of events, topics, and possible risks that should be communicated. According to the informants and following the general guidelines of emergency communication (e.g., United States National Science and Technology Council Subcommittee on Natural Disaster Reduction, 2000), such information or notification should include, for example, the magnitude and duration of the incident, precautionary actions that could be taken, and details on where to find additional information on the subject.

Citizens' Information Sharing During Crises

The second discussion topic was how and with whom the participants themselves would like to communicate and share information in crises and emergencies. In addition, they were asked to discuss what kind of information they would share and via which media. In line with the outcome of the first discussion topic, the participants in all three groups stated rather unanimously that, first and foremost, they would try to make contact with their close family or friends. The participants also mentioned the concept of "neighbor help," reporting that they would try to contact neighbors and others living nearby, even those unfamiliar to them or strangers. The idea of helping those geographically close was discussed most concretely in the session that took place in the rural area, where the participants said they were sure to receive help from the local community when in need. That idea was described, for example, as follows:

> *I think that in that kind of* [crisis] *situations, if the neighbors and other friends were okay, they surely would invite me to their place to stay overnight. I can remember one summer when a birch tree fell and crushed a playhouse in our backyard. Somebody called immediately and asked if we needed help.* (G1/P3)

The participants from the urban area indicated that volunteer citizen organizations could be a relevant actor for gathering information, mobilizing help, and allocating resources in line with community needs. They also remembered local radio broadcasts of messages about the possibility of lending water pumps to citizens during a flood in the city area. On the question of how to encourage people to participate in voluntary support activities, the participants suggested that the request to participate come from someone within their social network or from a volunteer group rather than from the authorities because *"if the person who asks you to join a voluntary group is somebody you know, it's more probable that you will take part"* (G2/P4). For this, social media was seen as a potential platform.

The participants felt that officials and authorities can be difficult to reach when needed. Participants suggested a two-level call service in which less time-critical yet important topics or questions could be directed to one number while emergency situations would be reported to another. Contacting authorities directly and using, for example, personal email was assumed to be an impossible option because they did not expect authorities to accept personal contact. On the whole, the participants were skeptical as to how authorities regard or value any information, observations, or contribution offered by the public. They did not expect authorities to be receptive, as stated by one participant: *"And how would the authorities treat this kind of information? Meaning they would just ignore the information, for example, if you would warn them about some suspicious bag lying somewhere..."* (G2/P2). However, the participants felt that, as local residents, they could have exceptional and invaluable knowledge about the surrounding environment and conditions and so could be of assistance to authorities:

> *And it's always the people who actually live in the area: They're the ones who have the best knowledge concerning the surrounding environment. I'm guessing they are the ones who could be of assistance to the authorities.* (G3/P3)
>
> *They know the local conditions the best.* (G3/P4)
>
> *Yes, that's right!* (G3/P3)

Citizens' Use of ICTs During Crises

The third discussion topic dealt with the use of ICTs for communicating about crisis and emergency situations. The participants were asked to discuss what technologies they have used in previous situations and why and to tell what they had learned from such experiences. Participants also were asked what ICTs they would prefer to use in the future. A trend towards the use of multiple channels and methods for communicating emerged clearly from the discussions, as the majority of the participants reported using mobile phone, television, radio, and the Internet to receive and acquire information during crises and emergencies.

From among all the communication devices and methods discussed, the most discussion time was spent on the use, benefits, and potential of mobile phones. During incidents, the ability to communicate directly with a human representative from a responsible organization via a mobile phone was highlighted. In addition, the mobile phone was noted as valuable for contacting other individuals—even those with whom they have no personal relationship— from the same geographical community, for example, contacting neighbors to warn them about possible security threats and burglaries. This kind of behavior was discussed, in particular, during the session with the participants from the rural area, where sharing information and helping other members of the community more often involved calling neighbors, as opposed to using social media. The importance of mobile phones during crises and emergencies was highlighted, for example, in the following way:

> *Well, this is absolutely the best device* [points to the mobile phone] *because it is always with you in dangerous situations and it is the first one you use. I have used this many times to call an ambulance and sometimes also the fire service.* (G1/P5)

In addition, the ability of mobile phones to provide better means in general to reach people and to receive and provide timely information was discussed in depth. The mobile phone had the advantage of always being with the user and typically always switched on, qualities lacking in the case of many other information channels. The possibility to use mobile phones as a channel to present early warnings also was suggested:

> *I feel it would be useful if the authorities would send mass text messages targeted to a specific area. This would be something I would like to use myself, as I would receive the information promptly because I have my phone always near me and turned on.* (G3/P4)

However, participants acknowledged that mobile phones do have limitations. Particularly during blackouts, phones may run out of power and not be chargeable. Additionally, a phone might be turned off or muted from time to time.

During every discussion session, the radio was seen as a convenient source of information in emergency situations, also during power outages. The participants considered the radio especially suitable for receiving information when driving. In addition, the capability of radio technology to disseminate information to a specific area was seen as a convenient feature.

The use of the Internet for receiving and finding information was discussed during the sessions. The participants reported using various Internet sources to search for specific information. Several participants stated that they follow the progress of events via news media Web sites. The convenience of using these sites was seen to be influenced by their everyday use as the source for other information needs: "*I think that it* [the selection of a Web

page from which one starts to seek information] *is mainly a question of your habitual use of the Internet*" (G1/P6). The same sources preferred in normal conditions were preferred as well in crisis situations, although with higher frequency. This confirms the relevance of media use habits as described in the literature (Vihalemm, Kiisel, & Harro-Loit, 2012).

Obtaining information from the Web sites operated by cities or municipalities was seen as troublesome because, in the experience and opinion of the participants, these sites are not updated frequently or fast enough in a crisis, thus making the information appear out of date, inaccurate, and thus unreliable. However, when they first hear about an incident from another source, the participants noted they often will check the local authorities' sites to see if officials have reacted in any way to the situation. The participants discussed this situation, for example, in a following way:

> *The thing with the municipality's Web sites is that they only work* [are updated] *during the daytime, when the authorities are working. I have at times tried to find some information from their sites concerning some situation but it has never been successful.* (G2/P5)

> *And then it* [information] *gets easily out of date because there is no one to take care of this.* (G2/P2)

> *Yeah, the government and the municipality, they are, like, so unreliable.* (G2/P6)

In general, when seeking information from the Internet, the participants reported that they hardly ever rely on a single source. The general procedure seemed to be to seek confirmation of received information from several different sources in forming a comprehensive understanding of a given event. Thus, the necessity for the response network to cooperate and align information was highlighted.

The role of social media in communicating about emergency-related matters and situations did not receive as much coverage as the other information sources and communication channels. For example, Twitter was not mentioned in any of the group discussions. This can be explained by the fact that, in Finland, Twitter is used less frequently than Facebook. The low level of importance of social media during the discussions can be explained in part by looking into the demographics on the adoption rate of Facebook, the most popular social media platform in Finland. According to 2012 statistics, the adoption rate of Facebook among Finns born in 1960 (the average birth year of our participants) was just 29% (Finnish Broadcasting Company, 2013) but rising. Nevertheless, the regular social media users in the groups raised the possibility of utilizing social media, more specifically Facebook, for various purposes in the crisis and emergency domains. For example, they suggested that local volunteer groups could use Facebook to send requests for assistance to the public. In addition, individuals themselves could use Facebook to ask friends and acquaintances for help in a crisis. This was seen as a convenient means to contact most close friends and family simultaneously.

The possibility of sharing a photo from the scene of an accident via social media was discussed in one focus group session, where one of the participants mentioned having done so and others had seen posts with similar content by social media users reporting incidents as eyewitnesses. During this conversation, the participants also discussed the ethics of publishing photos of accidents online, especially in a life-threatening situation.

Participants expressed doubts about the reliability of information disseminated in social media. Discussion also dealt with the emotional stress of reading and going through

comments and posts that other people may share during events and expressed concerns over how individuals react to them. Thus, the need for the presence of authorities in social media was acknowledged so that any false rumors or information could be corrected quickly and undue panic could be avoided. However, participants doubted whether authorities and officials use or would want to use social media as extensively as would be needed and as is currently possible. In addition, the participants from the rural area believed that getting a response via social media takes a lot longer than by contacting the authorities by phone. Expectations towards the use of social media by authorities seemed lower than expectations of its use by private companies. The following illustrates the doubts participants had toward authority use of social media:

> *I don't believe the municipality or authorities use social media very much. In fact, I don't think they inform the public directly at all.* (G2/P2)

> *It's a pity that it's not done yet nowadays. After all, there are so many of us who use social media.* (G2/P5)

> *Yes, if we are here in social media, maybe they are still living in the megaphone era.* (G2/P2)

MAIN IMPLICATIONS AND DISCUSSION

According to the data, individuals want to be more situationally aware during crises and emergencies. If an alert is issued, they want to know if it has an impact on them personally. In addition, the need to know about the safety and security of close family members and friends in the affected area was a priority.

Supporting the views on emergency communication presented in the literature (e.g., United States National Science and Technology Council Subcommittee on Natural Disaster Reduction, 2000, p. 18), participants wished for more specific targeting of notifications on the part of authorities so that they would not be "bombarded" with too many personally irrelevant notifications and alerts. This could be done by targeting messages and integrating notifications with other sources of information that are used already (e.g., weather and route planning apps). Targeting messages can be achieved by restricting radio broadcasts to specific geographical locations. Mobile technology could be employed as well to provide location-based alerts because this technology can recognize mobile phone users' geo-locations (e.g., by cell information, GPS, Wi-Fi). The possibility and benefits of using mobile phones for targeting notifications in the crisis and emergency management domain has been discussed both in academic research (see, e.g., Aloudat & Michael, 2011; Kauppinen, 2012) and among practitioners (e.g., Miller, 2013; Office of the Emergency Services Commissioner [Australia], 2013), as well as by legal authorities, as seen through the modification of laws and regulations to enable the dissemination of targeted emergency notifications via mobile text messages (Finlex, 2004).

The participants stated that the requirement of the timely delivery of information is not being met. This was seen to be caused primarily by, in the participants' view, the authorities' habit of withholding information during a crisis. The informants suggested that authorities and crisis and emergency management organizations should adjust their communication strategies to improve perception of them as reliable information sources. Even if authorities do not have a

comprehensive view of the crisis situation in the early stages, the public should be addressed nevertheless, to reduce uncertainties and to demonstrate that the situation has been acknowledged and is being addressed (see, e.g., Veil et al., 2011). If authority information is not available soon after an incident and updated regularly, the source might not be consulted again.

Participants emphasized the need to receive information about events as soon as possible. This can be achieved by using multiple channels for disseminating messages. Multiplatform strategies need a specialized work force and facilities as part of the communication planning and preparedness of authorities. Moreover, the perceived underutilization of Web sites and social media in providing information to the public by the authorities was criticized. Current efforts by authorities to deliver information via the Web were seen as slow and inconsistent, whereas authorities' utilization of social media was unheard of by the participants. The informants' experience was that most information was sent out via news media.

The need for average citizens to be able to contact authorities and officials to ask for help and advice on various situations—ranging from life-critical events to lower priority, yet important, questions concerning personal well-being—also represented an important issue for the participants. They lamented that calling the authorities seems to be the only means by which to contact them. Even if calling is useful and necessary for some situations, the informants desired also other avenues to use, especially in a case of lower priority questions. If other channels were available, perhaps the need to phone the authorities might be decreased. Moreover, owing to the perceived difficulty of contacting the authorities, participants expressed doubts about whether authorities wanted the public to contact them on matters that are not highly critical.

The problem with complementary use of social media to contact the authorities has to do with the citizens' low expectations, which are not counteracted by authority communication activities. Expectations of and trust in emergency organizations is high in Finland, but this relates in just a minor way to communication. The participants considered the active role of authorities in social media as necessary, but not likely. In addition, their experience with government Web sites when looking for crisis-related information was that they were not kept updated. Participants seem to lack awareness that some authorities are active in social media and online communication. For example, the Finnish Police have an active social media presence with accounts and regular updates in both Facebook[2] and Twitter,[3] with the Police having over 200,000 likes in Facebook.

When authorities use social media to communicate with the public, they should ensure that the citizens who do not use or have no prior experience using social media (e.g., elderly people) would be able to find the same information elsewhere. The concern that many elderly people have limited ability to use the new ICT solutions also was raised in the focus groups. Because not all citizens are able or willing to use new ICTs, communication by response organizations should use multiple channels and may need to include various languages. ICTs employed in distributing information should be easy to access and use, even in stressful situations.

In the opinion of the focus group participants, authorities and officials do not generally consider individuals and local communities as potential resources in crisis and emergency situations. The perceived low level of motivation to incorporate the public in response to crises in Finland may be affected by the fact that Finland is a relatively stable country with few natural or man-made disasters. Thus, with fewer large-scale disasters, the pressure to improve current ways of working is lower. After an incident has occurred and has been

resolved, the motivation to develop new procedures and take new solutions into use soon starts to degrade. Fundamentally, however, the lack of collaboration seemed to be less about citizens' willingness to take part in coproducing safety and more about their expectations that authorities think top-down.

There are several reasons for incorporating the public in crisis preparation and response, even though social and environmental conditions are relatively stable. First, involvement increases individuals' self-efficacy, provides a sense of control over the situation, and increases a person's ability to cope with the situation (e.g., Sutton et al., 2008; Veil et al., 2011). In addition, the added value of increased situational awareness can be achieved by making use of the public as sensors (Valuch, 2013), as was demonstrated during the regional floods in the Czech Republic in 2013.

In all the focus groups conducted during this research, the majority of conversations revolved around two key areas: (a) how authorities' organizations and actors, such as the police, fire department, and local government, communicate with the public in crises and emergencies and (b) how the public could better reach the authorities with information or resources. Participants also discussed how they communicate and operate in crises and emergency-related matters outside the relationship with the authorities, utilizing personal social networks during crises and disasters. Beyond formal authority information, communication among one's close circle of family and friends has a high impact on citizens' perceptions of crises and personal risks and on an individual's actions. Information from such relationships is often the most trusted.

Outside their immediate circle of relationships, the participants understood their relevant community to include people in close geographical proximity, such as neighbors. This observation applied in both rural and urban areas. In addition to contacting each other directly, either face-to-face or by calling, the local media (radio, news media) and volunteer or other local organizations were noted as relevant and suitable actors for organizing the gathering information and allocating help and resources in accord with the needs of the area. When discussing the motivation to participate in giving assistance, social influences, in terms of the opinions of others and examples of participation, were seen as having a positive impact on the decision to volunteer one's services. In addition, social media was seen as a potential platform for the coordination of and collaboration among volunteers. Because of doubt in the reliability of information presented in social media by peers, individual volunteer efforts and collaboration benefit from the involvement of an organization already deemed trustworthy, such as the Red Cross, a local volunteer group, or a local school or church group. Such involvement could have a positive effect on the willingness of individuals to participate. Therefore, volunteer organizations and local media could play an important role in fostering the uptake of new methods of involving the public in collaborative resilience, such as sharing situational information emanating from the impact area or simply by requesting that individuals participate.

CONCLUSIONS

In this study, citizens' communication habits and use of ICTs during crises and emergencies was examined by means of focus groups with members of the public. Collecting the data via the focus group method had the advantages of yielding rich data and giving the participants

an opportunity to reflect on their experiences together with other citizens, as well as allowing the researchers to delve deeper into informant comments, if needed. However, although no one person dominated in the three focus groups and all participants took part in the discussion, other informants' responses and various group processes might have influenced the participants' willingness to share certain experiences and opinions, as well as their courage to participate in group discussion in the time available. Thus, individual interviews could be arranged in the future to deepen the understanding of the findings yielded from the focus group comments in this study. In addition, the participants' expectations about what they should answer and what the researchers were expecting might have influenced the responses (e.g., Frey et al., 2000). Moreover, only half of the participants ($n = 10$) had first-person experiences of crisis or emergency situations. While these informants could describe their actual behavior and ICT use during a crisis or emergency, the other participants could only imagine what they might do and how they might employ ICTs in such situations.

Although we had a sufficient number of participants for the purposes of qualitative research, a greater number would have added to the credibility of the findings. All in all, the dataset was rather small and the respondents taking part in this study were not fully representative of the Finnish population, thus generalizable conclusions cannot be drawn. Moreover, use of ICTs varies across cultures and regions (see, e.g., International Telecommunication Union, 2014), preventing us from generalizing the findings beyond Finland.

Even with these limitations, this research into citizens' communication habits and use of ICTs during crises and emergencies contributes significantly to the literature related to crisis management. The results provide further insight into with whom and how citizens prefer to communicate in such situations and what they expect from authorities. The value of understanding these preferences lies in being able to further the community approach to crisis and emergency management. The reality is that authorities cannot solve most crises alone. Even when emergency services are of high quality, societal resilience is a coproduction of many actors who require timely and complete communication. Citizens and citizen groups are willing to participate in crises response, yet public engagement is not actively enabled. Citizens in this study did not expect authorities to be interested in their input, to update Web sites during crisis situations, and to have active social media accounts. Public awareness that some authorities are active online seemed lacking. By building connections prior to crises, the coproduction of safety and response activities by citizens and officials can be strengthened. By understanding not only the behavior and information needs of individual citizens but also of the groups they form, authorities and other organizations working in the crisis response field can better plan their communication using suitable channels to not only disseminate directives but also to incorporate and share situational information provided by citizens. When necessary, new channels and platforms must be created, used, and maintained according to citizens' needs. The different capabilities and habits of individuals (citizens as well as officials) with respect to ICTs should be taken into consideration by organizations in order to provide communication that is usable by all.

ENDNOTES

1. All data examples are translations from Finnish into English, translated by the authors. In the data quote source code, *G* is the abbreviation for the focus group session and *P* for the participant.

2. For more information, see https://www.facebook.com/Suomenpoliisi.

3. For more information, see https://twitter.com/SuomenPoliisi.

REFERENCES

Aloudat, A., & Michael, K. (2011). The application of location based services in national emergency warning systems: SMS, cell broadcast services and beyond. In P. Mendis & A. Yates (Eds.), *Recent advances in national security technology and research: Proceedings of the 2010 National Security Science and Innovation Conference* (pp. 21–49). Canberra, Australia: Australian Security Research Centre. Retrieved November 4, 2014, from http://ro.uow.edu.au/cgi/viewcontent.cgi?article=9366&context=infopapers

Beneito-Montagut, R., Anson, S., Shaw, D., & Brewster, C. (2013). Governmental social media use for emergency communication. In T. Comes, F. Fiedrich, S. Fortier, J. Geldermann, & T. Müller (Eds.), *Proceedings of the 10th International Information Systems for Crisis Response and Management [ISCRAM] Conference* (pp. 828–833). Baden-Baden, Germany: ISCRAM. Retrieved November 4, 2014, from http://www.iscramlive.org/ISCRAM2013/files/152.pdf

Currie, D. (2009). *Expert round table on social media and risk communication during times of crisis: Strategic challenges and opportunities* [Special report]. Retrieved August 6, 2014, from http://www.boozallen.com/media/file/Risk_Communications_Times_of_Crisis.pdf

Federal Emergency Management Agency [FEMA], United States Department of Homeland Security. (2011). *A whole community approach to emergency management: Principles, themes, and pathways for action*. New York, NY, USA: FEMA. Retrieved December 29, 2012, from http://www.fema.gov/library/viewRecord.do?id=4941

Finlex. (2004). *Sähköisen viestinnän tietosuojalaki* [Act on the protection of privacy in electronic communications]. 16.6.2004/516 35 a §. (17.3.2006/198) Teleyrityksen velvollisuus välittää kohdennettu viranomaistiedote [The obligation of mobile operators to transmit allocated notifications from authorities to the public]. Retrieved March 12, 2013, from http://www.finlex.fi/fi/laki/ajantasa/2004/20040516

Finnish Broadcasting Company. (2013). *Katso, kuinka moni ikäisesi suomalainen on Facebookissa* [See how many Finns your age are on Facebook]. Retrieved November 4, 2013, from http://yle.fi/uutiset/katso_kuinka_moni_ikaisesi_suomalainen_on_facebookissa/6522711

Frey, L. R., Botan, C. H., & Kreps, G. L. (2000). *Investigating communication: An introduction to research methods* (2nd ed.). Needham Heights, MA, USA: Allyn & Bacon.

Goldstein, B. E. (2011). *Collaborative resilience: Moving through crisis to opportunity*. Cambridge, MA, USA: MIT Press.

Goolsby, R. (2010). Social media as crisis platform: The future of community maps/crisis maps. *ACM Transactions on Intelligent Systems and Technology, 1*(1), 7–17.

Helsloot, I., & Ruitenberg, A. (2004). Citizen response to disasters: A survey of literature and some practical implications. *Journal of Contingencies and Crisis Management, 12*(3), 98–111.

Hughes, A. L., & Palen, L. (2009). Twitter adoption and use in mass convergence and emergency events. *International Journal of Emergency Management, 6*(3/4), 248–260.

International Telecommunication Union. (2014). *The world in 2014: ICT facts and figures*. Retrieved August 6, 2014, from http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf

Kauppinen, O. (2012). *Mobiilipohjaisen hälytysjärjestelmän hyödyntäminen viranomaisviestinnässä ja kriisinhallinnassa: interaktiivinen lähestyminen* [The invocation of mobile-based alerting system in

authorities' communication and crisis management: An interactive approach] (Master's thesis). University of Jyväskylä, Finland. Retrieved November 20, 2014, from https://jyx.jyu.fi/dspace/bitstream/handle/123456789/41730/URN:NBN:fi:jyu-201306111942.pdf?sequence=1

Krueger, R. A., & Casey, M. A. (2009). *Focus groups: A practical guide for applied research* (4th ed.). Thousand Oaks, CA, USA: Sage.

Liamputtong, P. (2011). *Focus group methodology: Principles and practices*. Los Angeles, CA, USA: Sage.

Lindsay, B. R. (2011). *Social media and disasters: Current uses, future options, and policy considerations*. Washington, DC, USA: Congressional Research Service. Retrieved November 4, 2014, from http://fas.org/sgp/crs/homesec/R41987.pdf

Miller, J. (2013, September 16). *Mobile phone emergency alert system to be tested in UK*. British Broadcasting Corporation News [online]. Retrieved October 3, 2013, from http://www.bbc.co.uk/news/technology-24113790

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*(1), 127–150.

Office of the Emergency Services Commissioner [OESC; Australia]. (2013). *OESC pleased with location-based emergency alert test*. Retrieved October 3, 2013, from http://www.oesc.vic.gov.au/home/media+release+oesc+pleased+with+location+based+emergency+alert+test

Reuter, C., Heger, O., & Pipek, V. (2013). Combining real and virtual volunteers through social media. In T. Comes, F. Fiedrich, S. Fortier, J. Geldermann, & T. Müller (Eds.), *Proceedings of the 10th International Information Systems for Crisis Response and Management* [ISCRAM] *Conference* (pp. 780–790). Baden-Baden, Germany: ISCRAM. Retrieved November 4, 2014, from http://www.wiwi.uni-siegen.de/wirtschaftsinformatik/paper/2013/2013_reuterhegerpipek_combiningrealvirtualvolunteerssocialmedia_iscram.pdf

Reynolds, B., & Seeger, M. W. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication, 10*(1), 43–55.

Statistics Finland. (2013). *Population of Finland*. Retrieved May 22, 2013, from http://www.stat.fi/tup/suoluk/suoluk_vaesto_en.html

Stewart, D. W., Shamdasani, P. N., & Rook, D. W. (2007). *Focus groups: Theory and practice* (2nd ed.). Thousand Oaks, CA, USA: Sage.

Sutton, J., Palen, L., & Shklovski, I. (2008). Backchannels on the front lines: Emergent uses of social media in the 2007 Southern California wildfires. In F. Fiedrich & B. Van de Walle (Eds.), *Proceedings of the 5th 10th International Information Systems for Crisis Response and Management* [ISCRAM] *Conference* (pp. 624–631). Washington, DC, USA: ISCRAM. Retrieved November 4, 2014, from https://www.cs.colorado.edu/~palen/Papers/iscram08/BackchannelsISCRAM08.pdf

United Nations International Strategy for Disaster Reduction [ISDR]. (2011). *2011 global assessment report on disaster risk reduction: Revealing risk, redefining development*. Geneva, Switzerland: United Nations ISDR.

United States National Science and Technology Council Subcommittee on Natural Disaster Reduction. (2000). *Effective disaster warnings: Report by the working group on natural disaster information systems*. Washington, DC, USA: UNT Digital Library. Retrieved November 4, 2014, from http://digital.library.unt.edu/ark:/67531/metadc25972

Valuch, J. (2013). Power of crisis crowdsourcing & media broadcasting: Three key roles for mapping emergencies live [Web blog post]. Retrieved October 20, 2013, from http://blog.ushahidi.com/2013/08/12/power-of-crisis-crowdsourcing-media-broadcasting-3-key-roles-for-mapping-emergencies-live

Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A work-in-process literature review: Incorporating social media in risk and crisis communication. *Journal of Contingencies and Crisis Management, 19*(2), 110–122.

Vihalemm, T., Kiisel, M., & Harro-Loit, H. (2012). Citizens' response patterns to warning messages. *Journal of Contingencies and Crisis Management, 20*(1), 13–25.

Authors' Note

All correspondence should be addressed to
Matti Haataja
Faculty of Information Technology,
Department of Computer Science and Information Systems
University of Jyväskylä
PL 35 (Agora)
40014 University of Jyväskylä
matti.haataja@jyu.fi