

Online Mentioning Behavior during Hurricane Sandy: References, Recommendations, and Rebroadcasts

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ABSTRACT

Large-scale crisis events require coordination between the many responding stakeholders to provide timely, relevant, and accurate information to the affected public. In this paper, we examine how social media can support these coordinated public information efforts. This research considers how emergency responders mentioned different organizations, institutions, and individuals by examining the social media communications of police and fire departments during Hurricane Sandy. We find that these departments use mentions to reference other sources of information, recommend credible information and sources, and rebroadcast information. These mentions offer insight into how emergency responders fit within a broader crisis information network and the types of entities that responders trust and recommend to provide information to the public.

Keywords

Crisis informatics, social media, emergency management.

INTRODUCTION

On October 29, 2012, Hurricane Sandy made landfall in Brigantine, New Jersey—hitting one of the most densely populated regions of the United States (US). Hurricane Sandy displaced an estimated 776,000 people (Yonetani, Holladay, Ginnetti, Pierre, Wissing, Morris and Natali, 2013) and damaged or destroyed over 650,000 homes (Blake, Kimberlain, Berg, Cangialosi and Beven II, 2013). The storm affected the entire eastern coast of the US, with the heaviest damage occurring in New Jersey and New York. Scientists estimate the cost of the hurricane at \$66 billion USD (National Climatic Data Center, 2014).

A severe, widespread crisis event like Hurricane Sandy requires large-scale information coordination between many different organizations and affected stakeholders (Mileti and Sorensen, 1990; Tierney, Lindell and Perry, 2001; Reynolds and Seeger, 2005). Hurricane Sandy's response included official emergency response organizations (e.g., police, fire, emergency medical services, the Federal Emergency Management Agency (FEMA)), organizations that provide information or public services (e.g., the National Weather Service (NWS), public health departments, electric companies, transportation authorities), elected government officials (e.g., state governors, city mayors), and non-profit relief organizations (e.g., American Red Cross) among others. During a crisis event, these entities—organizations, institutions, and individuals—must work together to provide timely, relevant, and accurate information to members of the public.

In recent years, social media have expanded the ways in which emergency responders can communicate with the public. Responders can now share information directly with a widespread public audience instead of having to rely on traditional broadcast media (Palen and Vieweg, 2008; Hughes and Palen, 2012). Social media also provide increased opportunities to engage in two-way conversations with the public (Palen and Liu, 2007; Latonero and Shklovski, 2011; Hughes and Palen, 2012; Deneff, Bayerl and Kaptein, 2013; Sutton, Spiro, Fitzhugh, Johnson, Gibson and Butts, 2014). Most of the research in this area has focused on how emergency responders use social media to communicate solely within their jurisdiction. The research reported here expands on this research by examining how public information coordination between emergency response stakeholders

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Proceedings of the ISCRAM 2016 Conference – Rio de Janeiro, Brazil, May 2016
Tapia, Antunes, Bañuls, Moore and Porto de Albuquerque, eds.

over many jurisdictions happens across social media.

To better understand public information coordination during large-scale crisis events, we examine how fire and police departments mentioned different entities in their social media communications during Hurricane Sandy. Study of these mentions offers insight into the crisis information network and the types of entities that responders trust to provide reliable information to the public.

BACKGROUND

Within the crisis informatics field (Hagar and Haythornthwaite, 2005; Palen, Vieweg, Liu and Hughes, 2009), a growing body of research examines social media use in emergency response practice. An early observation of emergency responder social media use (Latonero and Shklovski, 2011) revealed the important role that a social media evangelist can play in advancing an organization's social media adoption. Deneff et al. (2013) looked at how two police departments used Twitter during the London Riots of 2011. They found that each department had its own communication style. One department used an instrumental approach, where communications were more formal and detached. The other department used an expressive approach, which was more personal and engaged with the public. Hughes and Palen (2012) interviewed emergency public information officers (PIOs) to understand their perceptions of social media and social media's effect on their work practice. Results showed that social media use by emergency responders is challenged by trust and credibility issues, outdated policies and processes that make it difficult to use social media, and the lack of management support, training, resources, and time. Plotnick et al. (2015) surveyed US emergency managers about their use of social media and found that lack of appropriate organizational policies and guidelines for social media is a major barrier to its use for county-level EMAs. Hughes and Chauhan (2015) analyzed the online public communications during Hurricane Sandy and offered trust-building recommendations to emergency responders. Much of the research in this area has observed slow adoption by emergency responders and a tendency for those who have adopted social media to use them as a one-way communication stream to push information to the public (Sutton, 2009; Sutton, 2010; Latonero and Shklovski, 2011; Hughes, St. Denis, Palen and Anderson, 2014).

A few recent studies have looked at how emergency responders use social media within a wider crisis response effort. Sutton and colleagues (2013) examined Twitter use by emergency responders during the 2010 Deepwater Horizon oil spill. By examining network structure and conversational features, they could better understand how information was exchanged and disseminated. Results showed that health and public safety organizations tend to be more centrally located in social media networks, which makes them ideal communication partners for information distribution. More recently, Sutton et al. (2014) looked at the Boston Marathon Bombings and how emergency responders amplified messages sent through Twitter by retweeting these messages. We expand on this research by taking an in-depth look at how a particular social media behavior, that of mentioning, plays into the greater crisis response.

DATA & METHOD

We base this research on the results of a recent study (Hughes et al., 2014) that analyzes the online communications of fire and police departments during Hurricane Sandy. Focusing on the coastal regions within a 100 mile radius of Hurricane Sandy's US landfall, researchers identified 840 fire and police departments. For each of these departments, data were collected from the four most commonly used types of online communication media: a department website, a subscriber-based notification service (Nixle¹), a microblogging service (Twitter), and a social network site (Facebook). Researchers collected information about 676 websites, 930 Nixle posts, 3033 tweets, and 4652 Facebook posts over the data collection timeframe (October 24, 2012 – November 9, 2012). Of the social media messages, 889 Nixle posts, 2553 tweets, and 3766 Facebook posts were on-topic, meaning they were relevant to Hurricane Sandy. After coding this data for content and use, the researchers reported low overall use of online communication media during Hurricane Sandy and suggested better understanding of the reasons for this low use could reveal opportunities to increase its use and value to the emergency management community (Hughes et al., 2014). We obtained access to the data used in Hughes et al. (2014) as a starting point for the research reported here.

¹ Nixle is an information service where users subscribe to receive alerts and notifications from authenticated agencies and community organizations. Users choose the types of messages they want to receive and the method of delivery—including text messaging, email, and the Nixle website.

Mention Coding

Initial investigations into the Hughes et al. (2014) data revealed information coordination behavior in the messages that were coded as a “reference.” In this context, a reference was defined as a “reference to an external information source” (Hughes et al., 2014, 1507). This definition was too restrictive and not wholly representative of the types of information coordination happening in these messages. We wanted to study and understand the message features that indicated membership in or awareness of a larger response community. We use the term “mention” to describe those instances where a fire or police department referred to an organization, institution, or individual. Under this broad term, we then identified several subcategories that were more descriptive of each mention’s intent (described below).

To start the coding process, we revisited all on-topic Facebook (3776), Twitter (2553), and Nixle (889) messages to determine whether these messages mentioned an organization, institution, or individual. We then developed a coding scheme for the intent of each mention through iterative pair-coding and discussion. The intent of each mention fell into one of three categories: *reference*, *recommendation*, or *rebroadcast*. A message containing a *reference* cites an entity with the purpose of identifying where information has been or can be obtained. A message containing a *recommendation* endorses an entity as suitable for a particular purpose, role, or type of information. Lastly, a message containing a *rebroadcast* redistributes a previously sent message. In addition, we differentiated whether each mention referred to a third-party (Other) or to the sender of the message containing the mention (Self). This distinction was important because we encountered many instances where fire and police departments would mention themselves and we wanted to analytically separate this activity from third-party mentions. A message could contain more than one mention category. After finalizing the coding scheme, both authors coded the mention messages separately and then met together to resolve all coding discrepancies. Both authors have had prior experience coding this type of data.

Type	Description	Examples
Fire	Organization that fights fire and provides emergency medical services	FDNY ² , Surf City VFC
Police	Civil organization for maintaining order, preventing and detecting crime, and enforcing laws	Cranford PD, Vineland PD
Emergency Management Agency (EMA)	Organization that assists in coordination and planning for preparedness, response & recovery before, during & after a disaster	FEMA, Ready NJ, NJOEM
Humanitarian	Organization dedicated to public relief and welfare	Red Cross, NY Blood Center
Media	Traditional broadcast & print news - Radio, TV, Newspaper	USA Today, NBC, QAC TV
Utilities	Public services organization – water, gas, power	JCP&L, PSE&G, NJNG
School	Education institution	Springfield Schools
Weather	Organization responsible for monitoring and/or reporting the weather.	NHC, NWS, NOAA
Transport	Public transportation authority	NJ Transit, MDTA
Company	Business	Google, Xfinity, Tide
City	Incorporated municipality	Bay Head, Neptune City
County	County Agency	Salem County, Union County
State	State Agency	NJ.Gov, Delaware.Gov
Federal	Federal Agency	FDA, CDC, Energy.Gov
Politician	Elected government official	Gov. Christie, Gov. Markell
Private	Personal Account	Social Justice Worker, Writer

Table 1: Coding Scheme for the Entities Mentioned by Fire and Police Departments

² We have anonymized the names of private individuals and organizations, while the names of public entities remain unchanged.

Mentioned Entity Coding

We further coded for the different types of entities—organizations, institutions, and individuals—found in each mention. We first identified the mentioned entities in each message. After collecting the entity names, we iteratively grouped them into categories, resorting and regrouping until there was complete agreement between the authors around the final codes. Table 1 contains the entity coding scheme.

RESULTS/FINDINGS

Across Facebook, Twitter, and Nixle nearly half (49.7%) of the messages sent by fire and police departments during Hurricane Sandy contain at least one mention (see Table 2). Twitter messages (tweets) contain the most mentions (64.1%), likely because tweets are limited to 140 characters in length. This limitation means that fire and police departments tended to use Twitter to point to other information sources rather than as an information source by itself. Facebook messages were the next most likely to contain a mention (43.1%) and Nixle messages were the least likely (36.7%).

Online Media	# Total Messages	# Mention Messages	% Mention Messages
Facebook	3776	1626	43.1%
Twitter	2553	1636	64.1%
Nixle	889	326	36.7%
Total	7218	3588	49.7%

Table 2: Number and % of Facebook, Twitter, and Nixle Messages that Contain a Mention

When breaking down mentions by type (see Table 3), we see that Twitter has the highest percentage of messages containing a reference (40.9%). With the limited length of tweets (140 characters), police and fire departments often used Twitter to refer readers to a source where information could be obtained.

Nixle has the highest percentage of messages containing a recommendation (12.9%). Nixle messages in this dataset often read like press releases—lengthy messages that contain information about the response effort status, actions that should be taken by the public, and resources available for public assistance. Thus, these messages contained more recommendations of different emergency response organizations, institutions, or individuals.

Mention Type	Facebook		Twitter		Nixle	
	# msgs	% all msgs	# msgs	% all msgs	# msgs	% all msgs
Reference	759	20.1%	1045	40.9%	228	25.6%
Recommendation	161	4.3%	58	2.3%	115	12.9%
Rebroadcast	828	21.9%	538	21.1%	78	8.8%

Table 3: Number and % of Messages that Contain a Mention Type across Facebook, Twitter, and Nixle

Twitter and Facebook rebroadcast percentages (21.1% and 21.9% respectively) are considerably higher than Nixle (8.8%). Both Twitter and Facebook have built-in mechanisms for rebroadcasting messages, which explains at least some of this behavior. In addition, many departments have a website, blog, or other online account that allows them to post a link to Facebook and/or Twitter every time they make an update; we coded these posts as self-rebroadcasts. In this data set, many examples of this cross-posting behavior between Facebook, Twitter, and Nixle exist. This behavior indicates a tendency for these departments to use tools that allow them to post a single message to multiple sites and services, increasing the reach of the message and reducing the amount of work to post.

We now turn our attention to a detailed accounting of the different types of mentions: references, recommendations, and rebroadcasts. Following this accounting, we report on the types of entities mentioned by fire and police departments during Hurricane Sandy.

References Type

Those mentions categorized as a reference captured the broadest scope of intent and behavior. If a message mentioned an entity as a source where information could be obtained, it was categorized as a reference. Entities that were cited as a source of information were also labeled references.

Messages marked as containing self-references were those where the author of the message was cited as a service or source of information. Usually these references were made in the third-person:

Brigantine Police Department (10/31/2012 11:57) via Nixle: Brigantine Police. Travel ban is still in effect... We will advise shortly of any changes.

From the data (see Table 4), we see that self-references are less common in Facebook (3.1%) and Nixle (6.6%), and more common in Twitter (31.6%). More self-references in Twitter occurred because departments often used tweets as an advertising mechanism to point followers to their Facebook page, Nixle site, or website for more information. Facebook, Nixle, and websites can contain far more information than a 140-character tweet can.

When a message referred to a third-party entity as a source of information or a source through which more information could be obtained, we coded the mention as an other-reference. An example follows:

GNVFD (10/27/2012 16:52) via Twitter: From the National Weather Service: HIGH WIND WATCH in effect from Monday 6 A.M. - TUESDAY 6 PM. Winds 30-40 MPH up to 60-70 MPH.

Messages that contained an other-reference (see Table 4) are more common in Facebook (17.8%) and Nixle (23.1%) than in Twitter (9.8%). Again, Facebook and Nixle both support message lengths far longer than the 140-character limitation of tweets. Support for longer messages is likely why Facebook and Nixle messages have more other-references; these media simply have more room to include references to third-party entities.

Referencing a third-party can help to lend credibility to the information shared in a message, especially if the fire or police department sending the message does not have expertise in that area. For example, many 'other-reference' messages cited the National Weather Service (NWS) or the National Oceanic and Atmospheric Administration (NOAA) for information concerning Hurricane Sandy's approach and expected severity. By citing these organizations as the source of weather information, fire and police departments gave the information credibility and authenticity that could not have been achieved if they had simply given the information with no reference to the source.

Reference Type	Facebook		Twitter		Nixle	
	# msgs	% all msgs	# msgs	% all msgs	# msgs	% all msgs
Self	117	3.1%	807	31.6%	59	6.6%
Other	671	17.8%	250	9.8%	205	23.1%
Total	759	20.1%	1045	40.9%	228	25.6%

Table 4: Number and % of Messages Containing a Reference across Facebook, Twitter, and Nixle

Recommendations Type

Messages that contain a recommendation advertise an entity as accurate, timely, and/or credible. In particular, self-recommendation messages promote the author of the message as a trustworthy source:

@SpotswoodFD (10/27/12 22:29) via Twitter: The Spotswood Fire Department is now on Twitter, follow us at @SpotswoodFD. Information on Sandy will be shared from here.

Table 5 shows that self-recommendations are the least likely to occur of all mention message types (Facebook at 1.1%, Twitter at 1.2%, and Nixle at 2.0%).

Recommendation Type	Facebook		Twitter		Nixle	
	# msgs	% all msgs	# msgs	% all msgs	# msgs	% all msgs
Self	42	1.1%	31	1.2%	18	2.0%
Other	132	3.5%	28	1.1%	107	12.0%
Total	161	4.3%	58	2.3%	115	12.9%

Table 5: Number and % of Messages Containing a Recommendation across Facebook, Twitter, and Nixle

Other-recommendations describe instances where a fire or police department recommends a third-party entity for information and/or services:

Freehold Township Ind. Fire Company #1 (10/28/2012 21:13) via Facebook: For trustworthy updates during the storm and going forward, visit and like two pages - <https://www.facebook.com/#!/MonmouthCountyFireEmsPoliceNjspMedevacOps?fref=ts> and <https://www.facebook.com/#!/JerseyShoreHurricaneNews>

In this message, the author attempts to invoke trust-by-proxy; meaning, if the author of this message trusts these organizations, and you trust the author, then you can also trust these organizations.

Overall, messages that contain recommendations are less likely to occur. Yet, recommendation behavior is still important because it paints a picture of the bigger relief effort and the organizations and other responders that a particular organization trusts. Later in this paper, we take a closer look at who these departments recommended.

Rebroadcasts Type

Fire and police departments played an important role in the larger response effort by redistributing information from other responders. To be labeled as containing a rebroadcast, a message needed to be either a word-for-word redistribution of another message or a link to another message.

Table 6 shows that self-rebroadcasts were not common through Facebook (6.4 %) and Twitter (3.7%). Nixle messages contained only a few self-rebroadcasts (1.1 %). An example of a self-rebroadcast is given below:

Felton Community Fire Company, Inc. (10/28/2012 18:35) via Facebook: We have added some useful links to our website. <http://feltonfirecompany.org/message.cfm?id=82>

Self-rebroadcasts in Facebook and Twitter typically linked to messages that had been posted elsewhere by the same department (e.g., website, blog, Nixle, etc.). A self-broadcast in Nixle usually consisted of a press release that had been given to the broadcast media and then copy-and-pasted into Nixle for redistribution to the public.

Other-rebroadcasts redistributed information from a third-party. An example message that contains an other-rebroadcast follows:

@FDNY (10/29/12 18:00) via Twitter: RT @NYCMayorsOffice: Mayor: Stay inside, avoid using elevators and stay away from windows. #Sandy

These messages appeared more frequently in Facebook (15.5%) and Twitter (17.4%) than in Nixle (7.6%). In Facebook, rebroadcasting is usually done by sharing a post. In Twitter, rebroadcasting is accomplished through retweets. Nixle does not provide a built-in rebroadcasting mechanism. Rebroadcasting through Nixle was primarily accomplished by reposting the content of a report or press release from another entity.

Rebroadcast Type	Facebook		Twitter		Nixle	
	# msgs	% all msgs	# msgs	% all msgs	# msgs	% all msgs
Self	243	6.4%	94	3.7%	10	1.1%
Other	585	15.5%	444	17.4%	68	7.6%
Total	828	21.9%	538	21.1%	78	8.8%

Table 6: Number and % of Messages Containing a Rebroadcast across Facebook, Twitter, and Nixle

Rebroadcasting seems to serve at least three purposes. First, it redistributes information to a broader audience. Second, it authenticates a message as trustworthy and accurate. If a fire or police department does not trust the sender of a message or the message content, it is unlikely that they would have rebroadcast the message. Third, at a meta-level, rebroadcasts also say something about who fire and police departments want to be seen trusting

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*Proceedings of the ISCRAM 2016 Conference – Rio de Janeiro, Brazil, May 2016
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and supporting—perhaps to create a sense of solidarity with the greater emergency response effort (or at least the illusion of it).

Mentioned Entities

Next, we wanted to better understand what entities fire and police departments were referencing, recommending, and rebroadcasting. Understanding the subject of these mentions provides insight into the complexity of a large-scale crisis event—specifically what kinds of organizations and individuals fire and police departments interact with and trust. Table 7 contains the number of references, recommendations, and rebroadcasts (both self and other) for each type of mentioned entity.

We identified 16 different entity types that together capture the diversity of organizations, institutions, and individuals involved in a large-scale event like Hurricane Sandy (see Table 7). Represented here, we see many of the groups traditionally associated with a crisis response (Fire, Police, EMA, Humanitarian, Media), followed by institutions that represent the public systems affected by Hurricane Sandy (Utilities, School, Weather, Transportation). Also appearing are government organizations and individuals at various levels of jurisdiction (City, County, State, Federal, Politician) and those representing the private sector (Private, Company). The number and diversity of entities mentioned, offers insight into the scope and severity of Hurricane Sandy as it significantly disrupted the social and technical infrastructure of the affected area.

Entity	# References		# Recommendations		# Rebroadcasts		Total # Mentions
	Self	Other	Self	Other	Self	Other	
Fire	209	15	28	3	29	32	316
Police	773	41	60	11	317	73	1275
EMA	N/A	322	N/A	92	N/A	335	749
Humanitarian	N/A	48	N/A	9	N/A	19	76
Media	N/A	153	N/A	49	N/A	146	348
Utilities	N/A	92	N/A	20	N/A	45	157
School	N/A	11	N/A	5	N/A	8	24
Weather	N/A	199	N/A	38	N/A	185	422
Transportation	N/A	14	N/A	5	N/A	22	41
City	N/A	151	N/A	51	N/A	30	232
County	N/A	45	N/A	11	N/A	28	84
State	N/A	51	N/A	12	N/A	14	77
Federal	N/A	56	N/A	19	N/A	11	86
Politician	N/A	44	N/A	9	N/A	111	164
Company	N/A	25	N/A	4	N/A	5	34
Private	N/A	8	N/A	1	N/A	26	35

Table 7: Number of Messages Containing a Reference, Recommendation, or Rebroadcast for Each Entity Type

In Table 7, self-references, self-recommendations, and self-broadcasts only occur in the fire and police categories because we only analyzed messages from fire and police departments. These self-mention fields for all categories besides Police and Fire are marked “N/A” because the data was not available and beyond the scope of the research to obtain. The highest numbers of these self-mentions was in the self-reference category (773 from police departments and 209 from fire departments). The second highest numbers were found in the self-rebroadcast category (317 from police departments and 29 from fire departments). These findings suggests that fire and particularly police departments frequently use social media as a means to reference and redistribute their own information to a larger audience.

The entities with the most third-party mentions include Emergency Management Agencies—or EMAs—(749 mentions), institutions that report Weather data (422 mentions), and traditional broadcast and print Media (348 mentions). EMAs help with the disaster planning and coordination of an event like Hurricane Sandy; they are specifically trained to provide information and assistance in times of crisis. Thus, EMAs were a frequent subject of fire and police mentions. Because the crisis event involved a hurricane, accurate and timely weather

information was particularly important which explains why institutions that could provide that information were often mentioned. Finally, traditional media, such as local TV channels, radio stations, and newspapers, remain an important information channel for the public during any event. Fire and police departments would often share stories produced by the traditional media or recommend that the public follow traditional media channels for information updates.

In the data, we see strong patterns associated with the particular circumstances of Hurricane Sandy, which leads us to hypothesize that the mentioned entities would differ across different types of crisis events. For example, the large number of *Weather* mentions found during Hurricane Sandy would likely not exist around an earthquake or a terrorist attack. Similarly, one would expect more *Fire* mentions during a wildfire or more *Police* and *Politician* mentions around a political riot. Empirical investigation of these mention patterns is a topic for future research.

DISCUSSION

We have explored the online mentioning behavior of 840 fire and police departments during Hurricane Sandy and found that a significant portion of their online communications contain mentions (49.7%). The intent of each mention fell into one of three categories: a reference, a recommendation, or a rebroadcast. Results demonstrate that the social media of study (Facebook, Twitter, and Nixle) support the three types of mentions with varying degrees of effectiveness. For example, messages containing a rebroadcast mention were more common in Facebook and Twitter messages, likely because they both have mechanisms that make rebroadcasting easier (i.e., shares and retweets). In the remainder of this section, we address the broader implications of this research. Specifically, we discuss how mentions support information vetting, the visibility of emergency response efforts, and self-promotion.

Information Vetting

The mentions that fire and police departments included in their social media communications served as a vetting mechanism for public information. In their online messages, these departments would reference and recommend organizations, institutions, and individuals as credible and trustworthy sources of information. They also redistributed the information they felt was most important through rebroadcasts. Fire and police departments know their jurisdictions well, and mentions allow them to tailor their communication streams to best fit the needs of their citizens. This vetting behavior helps the public obtain the latest, most accurate information without having to follow each source independently. It also helps important disaster-related information reach a broader audience. This research suggests that the social media channels of trusted emergency responders could help members of the public sift through and identify the most critical information in the deluge of data typically found online during a disaster event.

Visibility of Emergency Response Efforts

The online mentioning behavior of fire and police departments offer digital glimpses of how these departments operated during Hurricane Sandy. By identifying the subject of each mention, we could see the many different stakeholders involved in a large-scale crisis response. Rarely—at least not without concentrated effort—can the public obtain such a view. Also visible were the relationships between emergency stakeholders. The messages these departments choose to reference, recommend, and rebroadcast demonstrated whom they trusted and whom they thought was most credible.

Emergency response organizations have never been so visible or accessible to the public before. However, with these new levels of transparency, come new levels of public accountability. Emergency responders must be more conscious of the way they portray themselves and their actions through social media. Similarly, responders must be more aware of the entities that they mention in their communications. If they reference, recommend, or rebroadcast entities that supply information or services of dubious quality, their credibility in the eyes of the public will likely decrease.

Self-Promotion

Through the significant number of self-mentions found in our data, fire and police departments engaged in self-promotion while also attempting to distribute their messages to a much broader audience. Self-promotion

behavior marks a significant shift from the past when the traditional media would typically handle the promotion and distribution of crisis information. While traditional media still play a large role, emergency responders now have much more control over the way public information is distributed to the public during times of crisis. Responders no longer have to rely upon the traditional media to communicate with the public (Hughes and Palen, 2012). In this context, self-promotion then becomes necessary because responders find they must make the public aware of the information services they provide and show themselves as accurate, credible sources of information. Consequently, these responders are taking on new responsibilities that require new skills—those of promoting and distributing information. Future research should focus on how responders use social media as a tool for self-promotion and distribution of messages (beyond the use of mentions) and the skills required to accomplish these tasks.

CONCLUSION

In this paper, we explore the way that emergency responders mention different organizations, institutions, and individuals, and how these mentions give insight into the complex public information space surrounding a large-scale crisis event. This work is part of a greater research agenda where we are trying to understand how social media can be used to effectively communicate important information to the public in times of crisis. Here, we have noted how different types of social media support different types of behavior and communications and we have hypothesized that the organizations, institutions, and individuals mentioned by responders will vary by event type. A next step for this research is to study mentioning behavior during different types of crisis events to understand how mentions vary across events.

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