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Explaining Attitudes Toward and Experiences with Social Media among Public Information Officers through Adaptive Structuration Theory

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ABSTRACT

This study set out to explore similarities and differences between firefighting organizations using and not using social media for crisis/emergency situations. Using Adaptive Structuration Theory (AST), our exploratory survey results from 129 first responders suggest social media innovations are outpacing PIOs' abilities to effectively adopt and utilize social media strategies. Of those who do not use social media, they have considered using it for information-dissemination purposes only; the main differences between those who do and don't use social media is their perception of the obstacles to implementing it (training, time, resources) and whether they use it in their personal lives.

Keywords: Adaptive Structuration Theory (AST), Social Media, Disasters, Public Information Officers, Emergency Response

INTRODUCTION

Social media are today what the printing press was almost 600 years ago—they allow people to spread information at a rate and to an audience not thought possible prior to their inventions. As noted by Sweetser and Weaver-Lariscy (2008) social media are “mediated opportunities for bringing people together encouraging social networking and dialogic communication” (p. 180). According to a February 2012 Pew Institute poll, 66 percent of people are connected to others through social media. When you consider that 2/3 of any community is reachable through a particular medium, its value, as part of a communication arsenal, becomes readily apparent (Brenner, 2012). In *Social Habit 2011*, a study conducted by Edison Research (2011) and Arbitron, “Approximately 46 million Americans ages 12 and older now check their social media sites and services several times every day.”

As traditional newspaper readership and network news viewership continue to dwindle, the social media revolution continues to take off. As of July 2012, more than 300,000 people per day are signing up for the microblogging site Twitter (SiteAnalytics, 2012). Thus, the first question of why should we care if social media are integrated into the fire departments' communication strategies should be self-evident—social media provide the fastest way for the public to obtain life-saving information (Jafarzadeh, 2011). Additionally, the growing number of studies indicates that the public expects to find answers on social media networks first (Fugate, 2011; Gary, 2011; Kingsley, 2009). If fire department PIOs are going to reach the largest audience possible, they need to recognize the value of pre- and post-emergency social media engagement and integrate the technology that will bring people to and through their websites. While many articles extol the importance of having formal social media procedures, there is little research as to why fire departments are lagging behind the adoption of new media technology. Adaptive Structuration Theory (AST) offers a framework for understanding how social media are creating a “technology-triggered organizational change” in fire departments (DeSanctis & Poole, 1994, p. 128), albeit a slow change.

The purpose of this study is to understand how fire departments are adopting social media into their communication. Are there similarities and differences between firefighting organizations that do and do not utilize social media for emergency situations, and what are the main obstacles for adoption? How do PIOs perceive social media and how might their attitudes toward new media affect their willingness to adopt social media?

To date, research has examined two aspects of social media use by emergency response organizations. First, they have illustrated how in emergencies organizations use social media to coordinate their efforts (White, Plotnick, Kushma, Hiltz, & Turoff, 2009). Second, they have clarified how those involved in the disaster have used social media to seek and share information as well as provide support for others (Starbird & Palen, 2011; Sutton, Palen, & Shklovski, 2008). Latonero and Shklovski (2011) have called for research that addresses the ways in which organizations use social media to communicate with their communities, but little attention has been given to the rate at which fire departments are integrating social media technologies.

Bottom line: social media have accelerated the community's involvement in managing information during all emergency situations. For example, immediately following the mass shooting at an Aurora, Colorado movie premiere of the latest Batman movie, @AuroraPD went from having 300 Twitter followers to over 11,000 in one day (“Virtual Lessons Learned,” 2012). When it comes to emergencies, the community is involved.

REVIEW OF RELATED LITERATURE

Social media, such as Twitter, Facebook, LinkedIn, FourSquare, YouTube, Flickr, and Pinterest, have become powerful tools for collaboration, sharing, and support of individuals, communities, and the media during emergencies (Dabner, 2012). “Disaster response may be the ideal environment for ‘proving the worth’ of social media as a serious knowledge management platform” (Yates & Paquette, 2011, p. 6). Social media build on small snippets of information from frequent, location-specific contributors who update in real time. Known as

“crowdsourcing,” small chunks of information are gathered from numerous experts simultaneously in various forms, such as microblogs, short videos, and social networks, and distributed via mobile devices (Howe, 2008). However, the “Tower of Bable” process that is organic and spontaneous presents serious challenges for Public Information Officers (PIOs), whose mission is to disseminate verifiably correct information in a timely manner to all constituents during emergencies. Emergency responders, such as fire departments, have yet to uniformly embrace social media, and many may even resent the public’s intrusion into their domain. It is a question of boundaries and “turf.” The notion of boundaries is an issue common to all organizations whose communication functions have been formulated around message control and flow. For example, in higher education, researchers Armstrong and Franklin (2008) found:

The historically more certain boundaries where information and communications were controlled by universities is being lost and institutions are struggling to make sense of how to operate in this changed and permeable space. The mindsets and frameworks of reference that we have used hitherto are no longer adequate (p.2).

As with many organizations, social media technologies have blurred communication boundaries and upended communication functions that have been virtually unchanged since the industrial revolution. Change has arrived, however. As one emergency responder put it, “What ultimately needs to ‘die’ in the Emergency Management profession is the distrust government officials illustrate regularly over feedback and input that they receive through social platforms from ‘the general public’” (“Not Dead,” 2012).

Adaptive Structuration Theory (AST)

Adaptive Structuration Theory (AST) “focuses on social structures, rules and resources provided by technologies and institutions as the basis for human activity” (DeSanctis & Poole, 1994, p. 125) and helps to explain the critical challenge for fire department PIOs. AST suggests that “social structures and interaction with a new technology create a technology-in-use that may be similar to or different from the way the technology was originally conceptualized by either the designer or the user” (Sinclair & Vogus, 2011, p. 298). The new social technologies have altered the structure of interaction between fire departments and the public, and between the fire department and the media (Del Aguila-Obra & Padilla-Melendez, 2006). AST as applied to social media suggests that the original purposes associated with Web 2.0 platform technologies (i.e., ability to interact with organizations, contact with friends and family, self publishing, etc.) have expanded and evolved well beyond anything the original developers could have imagined. Examples of the organic ability of social media to connect to others in disasters are in the news every day, from the massacres at Virginia Tech in 2008 to the Joplin, Missouri tornadoes in 2011 to the murders at the opening of the latest Batman movie, the *Dark Knight Rises*, in Aurora, Colorado in July, 2012—social media have superseded the structure, rules and functionalities of traditional disaster communication (Mello, 2012; Ungerfleider, 2011; Wittkower, 2012).

AST is useful in demonstrating how social media have created a boundary less communication environment during emergencies, quickly bypassing traditional PIO methodologies and protocols

for information dissemination. In emergency situations, social networking creates a continuous feedback loop that adds, embellishes, updates, deletes, and self-corrects through the propagation of instant messages by multiple contributors. In this scenario, PIOs must learn new tasks and new ways of interacting, “in a sophisticated atmosphere with few, if any restrictions” (Sinclair & Vogus, 2011, p. 298).

Finding the right balance between the traditional (one-way) official source dissemination methodology and the lightning fast (multi-way) phenomena created through social convergence during disasters and crises (Palen, Vieweg, Liu & Hughes, 2009) has become a much higher priority for emergency responders (Fugate, 2011; Jafarzadeh, 2011). This is where the concept of *curation* becomes an important function. Curation is the maintenance and appraisal of digital information over its entire life cycle. In an emergency, the PIOs should be master curators, assisting and engaging advocates to provide and update breaking news, and accurately managing the directions and key instructions for the community. Advocates might include local residents, volunteers, and firefighters on the line, media, and experts in evacuation. In non-emergency times, curation would be used to build brand or site loyalty for the fire department (http://www.ukoln.ac.uk/ukoln/staff/m.pennock/publications/docs/lib-arch_curation.pdf). To accomplish this, fire departments will have to understand how the media landscape has changed.

The Rise of Transmedia

The popular press, and in particular, public relations agencies, have been at the forefront of embracing social media strategies for everything from consumer interaction to corporate social responsibility (Levine, Locke, Searls, & Weinberger, 2009; Li & Bernoff, 2011; Solis & Breakenridge, 2009). Edelman (www.edelman.com), the largest public relations firm in the world, developed the model of Transmedia. The underlying concept is that every organization must now consider itself a media company and must manage more than information it “pushes” out to the public and the media. If an organization wants to remain viable in the future, it must be fully engaged in all aspects of communication, including curating information produced by others. This means that organizations must push and pull conversation to them. For fire departments, this will require fire command chiefs and PIOs to instigate changes in the standard protocol for emergency communication. This may include, but is not limited to changing and expanding the reporting hierarchies, spreading out communication responsibilities to line commanders, “deputizing” local volunteers, creating an ad hoc committee of community volunteers, and developing an interactive command site with local media outlets.

Edelman’s conceptual map of media today (see Figure 1) is separated into four distinct, but slightly overlapping categories: Mainstream, Owned, New Media, and Social. The cloverleaf demonstrates the integrated nature of communication with the center of the model *not the organization*, but *public engagement*. This is a dramatic shift away from the current structure of command and control, one-way, and top-down communication that the fire department has perfected. In one circle is mainstream media with whom the fire department has a working arrangement and to whom it provides twice-daily press conferences during emergencies. The fire department’s own media are all the information it controls and disseminates prior to, during, and after a community emergency. The two categories that fire departments need to address are new media and social media. To address new media and social media, PIOs need to determine how

technology structures and adoption processes can be incorporated into the overall communication strategies.

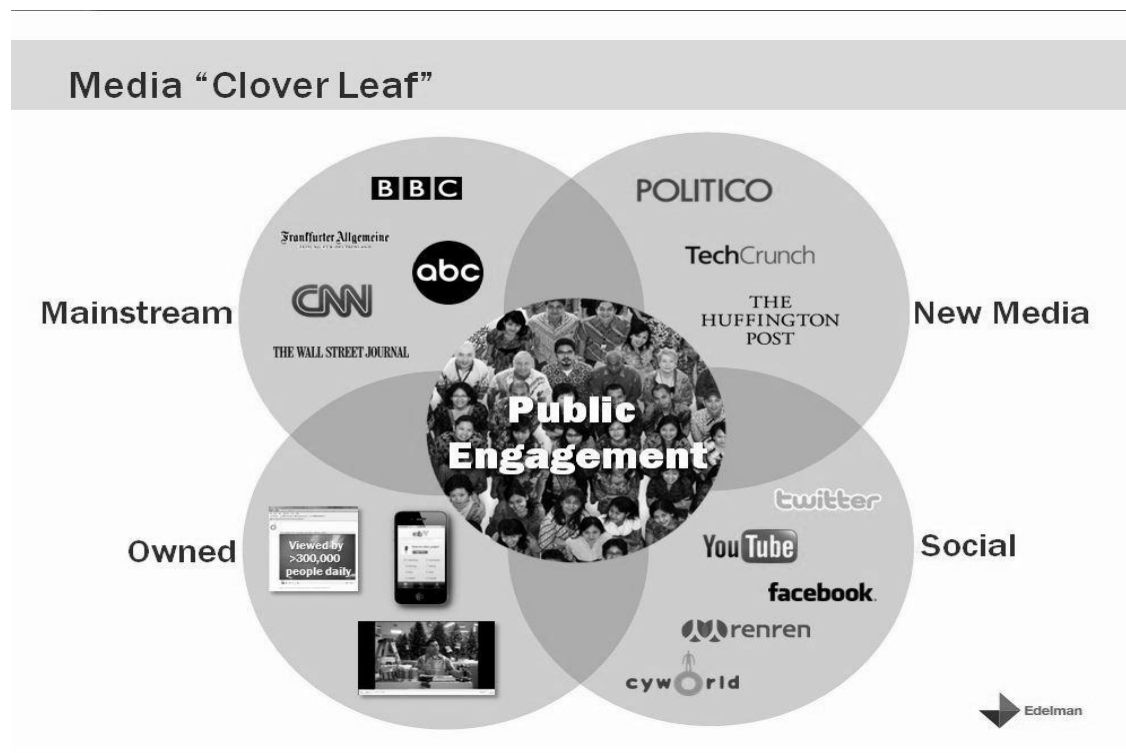


Figure 1: The Media Cloverleaf by Edelman (2012).

The Question of Resources

The question of resources is central to every decision made by fire departments and adopting social media is no different. While many scholars and experts call for the modification of long-standing emergency policies and procedures, there is no consensus on how many resources will need to be leveraged or diverted from other areas to create a functional social media presence (Crowe, 2010). However, as change is an endogenous process, it will be the continual and sustained usage of social media that helps to redefine relevant resources (Feldman, 2004). According to Sewell (1992) resources are “anything that can serve as a source of power in social interaction” (p. 9). Devoting an emergency responder, or two, to the communication function alone is often not an option for fire departments that are already stretched in terms of resources and it defeats the purpose and intrinsic value of social media. Adding a person perpetuates an existing hierarchical structure of communication, inserting boundaries into a boundary less arena. In an environment where accuracy and control have been central and critical, emergency management and public safety organizations must learn to find ways to share, curate, engage, and accept information and influence from the community (Lesperance, Godinez, & Olson, 2010).

One way of overcoming the potential resource barriers to implementing a social media plan and keeping people up to the minute is to develop a trusted volunteer network outside of the affected area who curate data through the social media (St. Denis, Hughes, & Palen, 2011). The

advantage to this plan is that they are “located outside of the impact area, and therefore not affected by power outages, adverse weather conditions or other service disruptions” (p. 8). Because social media are global and can be updated from anywhere with a connection, these people could be located in multiple time zones so that one or two people are not being overburdened by the task at hand. Essentially, this becomes the first step of a process to implement what the participants at a workshop on Social Networking for Emergency Management and Public Safety recommended: the need for agencies to begin to trust the public when it comes to managing emergencies (Lesperance et al., 2010).

In addition to resources, the formal structure of government-led emergency response can no longer be one of command and control. Web 2.0 focuses on user-generated content, which makes it possible for stakeholders, including the media, to generate “encapsulated knowledge chunks” (Yates & Paquette, 2011, p. 7) with mobile devices and geographic locators. In a world of social media, emergency responders are simply another source in the flow of information. When citizens begin to control the content being published through social media, emergency managers must consider the extent to which they are going to monitor and assess the public’s contributions to the conversation, especially in light of the limited electronic resources available for tracking conversations (Palen et al., 2009; St. Denis et al., 2011). To date, few emergency response organizations are equipped with the personnel or technology to monitor these conversations at the level necessary for it to be effective (Latonero & Shklovski, 2011). As social media become more mainstream, all governmental agencies will have to reorganize their communication functions. According to Palen, et al, 2009, “Large-scale emergencies can and will take the shape of a distributed network of vast information sources and skills, including those collective skills and products generated by the public” (p. 477-478).

Overall, governmental agencies may face obstacles such as public access; issues such as security, budgets, resources, training, and privacy; legal restrictions; and hackers and others who may not be providing accurate information (Fresenko, 2010).

Social Media Users and Non-Users

Before implementing social media into the emergency response group, it is important to understand the steep learning curve associated with the technology, especially for someone who has not been using it personally before starting to use it professionally (Heverin & Zach, 2010). Similarly, there are significant differences between the personal and professional social media environments: intentions, level of interactivity, and level of formality (Latonero & Shklovski, 2011). Personally, people use social media to connect with friends, family, professional allies, and people with similar interests or values. Professionally, organizations use social media to build relationships with their publics, disseminate information, build goodwill, and enhance their image. While the intentions can overlap, they are distinct enough to require different sets of skills and message construction processes. Currently, personal social media use is much more interactive than organizational social media use. Organizations are slowly developing the tools and recognizing the value of conversations rather than monologues online (Van Leuven, 2009). Finally, many organizations, particularly governmental agencies, view social media in the same way they view traditional media—they require a formal level of communication that is carefully planned and developed. Those who use social media personally are more likely to recognize its

informality and use the shorthand ways of presenting information necessary to get everything into a 140-character tweet.

Another issue that must be considered between social media users and non-users is the skill sets necessary. "People in an organization often have three sets of skills: the ability to gather information (analysts), the ability to package and push information (public relations or communications), and the ability to dialog about pushed information" (Lesperance et al., 2010, p. 12). Because those who hold public information officer positions are most likely the ones who can "package and push" information, they may not be the ones who should be in charge of an organization's social media presence. Finding others in the organization requires there to be more collaboration across organizational members and groups than most bureaucratic organizations are used to employing. Again, additional training may be necessary for these people to be able to cooperate and utilize the medium to its fullest potential.

Finally, the average public information officer is generally a member of Generation X (people born between the early 1960s and early 1980s) or the late Baby Boomers (people born between mid-1940s and early 1960s). Currently, younger workers are more eager and ready to jump right in with social media than older workers who may have a harder time with it, in part because of the amount of technology that needs to be learned (Chavez, Repas, & Stefaniak, 2010).

While not a personal use of social media, Avery et al. (2010) found that public health information officers were more likely to use social media if their departments had a web site prior to considering social media options; those without a web presence were less likely to adopt social media. A web presence may be viewed as an intermediate step in adopting social media. As PIOs become more familiar with the web presence, they may be more comfortable and better able to make the jump from a traditional information-pushing web site to an interactive social media presence. With these differences between users and non-users in mind, the following research questions are posed.

RESEARCH QUESTIONS AND HYPOTHESES

Literature in the area of social media use among first responders has been sparse and continues to grow as the use of social media grows. Much of the research has documented the disconnect between social media use and the command and control messages emergency responders have followed since the beginning of time. Also, the research focus has been on those who utilize social media and how they use it; little attention has been devoted to those who are not currently implementing a social media program. Finally, the obstacles to implementing social media have been consistent across studies and most of them revolve around resource issues. Given the lack of attention to those who do not use social media, we set out to compare and contrast social media use and non-use among firefighters. Thus, the following research questions are posed:

- RQ1: What are the characteristics of those first responder PIOs who do and do not use social media?
- RQ2: What differences exist in the use of traditional media between PIOs who do and do not use social media?

RQ3: Which combination of individual factors (age, education, sex, status, and use of social media outside work) best predicts social media use at work?

RQ4: Which combination of organizational factors (assignment as full-time PIO or full-time PIO/other responsibilities, department size, PIO training, status as sworn firefighter or civilian employee, years as PIO, years in current position, years with department) best predicts social media use at work?

METHODOLOGY

Participants

This study set out to examine social media use among firefighters and PIOs. The full survey contained 150 questions and items, including open-ended questions. An online survey link was sent to firefighters/PIOs in over 200 departments with 129 responding for a response rate of over 50 percent. The vast majority of responding fire departments were from California with a half dozen from other Western states, including Arizona, New Mexico, Oregon, and Washington. The results presented below focus solely on the firefighter/PIO characteristics that predict social media use, departmental characteristics that predict social media use, obstacles to social media use, and social media use in conjunction with traditional media.

Characteristic	Bachelor's				
Demographics					
Sex	Female N=40, 32.0%	Male N=85, 68.0%			
Age	18 to 24 N=2, 1.6%	25 to 34 N=15, 12.0%	35 to 44 N=42, 33.6%	45 to 54 N=48, 38.4%	55 and Over N=18, 14.4%
Education	High School N=5, 4.0%	Associate N=25, 20.2%	Baccalaureate N=57, 46.0%	Master's N=14, 11.3%	Doctorate N=2, 1.6%
PIO Training	Fire Dept. Classes N=65, 55.1%	Another Fire Dept. Classes N=37, 31.4%	Other Agency Classes N=98, 83.1%		
Employee Status	Sworn Firefighter N=80, 64.5%	Civilian Employee N=44, 35.5%			
Assignment	Full Time Inform. Duties N=36, 28.8%	Full Time Split Assignment N=77, 61.6%	Part Time N=13, 10.4%		
Service Years	1 to 9 N=38, 30.7%	10 to 15 N=31, 25.0%	16 to 21 N=17, 13.7%	22 to 27 N=27, 21.8%	28 and Above N=11, 8.9%
Years in Position	1 to 3 N=60, 48.4%	4 to 6 N=18, 14.5%	7 to 9 N=15, 12.1%	10 to 15 N=21, 16.9%	16 and Above N=10, 8.0%
Years PIO Experience	1 to 3 N=41, 33.1%	4 to 6 N=23, 18.5%	7 to 9 N=14, 11.3%	10 to 15 N=26, 21.0%	16 and Above N=20, 16.0%
Departmental					
Employees	1 to 50 N=7, 5.6%	51 to 100 N=16, 12.9%	101 to 200 N=30, 24.2%	201 to 500 N=33, 26.7%	500+ N=35, 28.2%
Use Social Media	No N=43, 33.3%	Yes N=86, 66.7%			

Table 1: Participant and Fire Department Characteristics.

A snapshot of the participants reveals that the majority of them were experienced in their time with the fire department, but much less experienced in their current position as PIO (see Table 1 for a complete description of their characteristics). These participants working at fire departments that ranged in size from less than 50 employees all the way up to 500+ employees. As is typical in this industry, over half of the respondents were between 35 and 55 with few in the beginning or ending stages of their careers. Almost half of the participants were educated with at least a bachelor's degree. Approximately one-third of the participants were female.

Instrument

One author, who has worked closely with regional fire departments and understands the communication culture, created the survey instrument for this study. His experiences guided the list of questions regarding perceived obstacles to use of social media, the types of training people have with respect to being a PIO, and traditional media used to disseminate information. Approximately 20 percent of the questions used in these analyses were nominal data divided between demographic questions (age, education, sex for personal characteristics; assignment as full-time PIO or full time PIO/other responsibilities, department size, PIO training, status as sworn firefighter or civilian employee, years as PIO, years in current position, years with department for organizational characteristics) and usage questions (e.g., which of the ways has the department considered using social media; which ways does the department use social media; reasons for not using social media; most useful social and traditional media options; utility of different ways of learning to use social media).

The remaining 118 items involved Likert items. These questions asked the extent to which people agreed with statements about personal attitudes toward social media use at work, their use of traditional media to reach people during an emergency, attitudes toward social media in general, use of social media to reach people during an emergency, and attitudes toward an engaged social media program. Open-ended items were not included in these analyses and served primarily to help the authors better understand the social media environment these people face. A complete list of the survey items is available from the authors.

RESULTS AND DISCUSSION

This study was primarily interested in the differences between fire departments that do and do not use social media to communicate with the public. We posed four research questions and present what the survey responses revealed.

Characteristics of PIOs and Fire Departments

The first research question was descriptive in nature as a first attempt at creating a composite picture of fire departments and PIOs who do and do not use social media. With respect to those who do not use social media, we specifically examined the ways in which they have considered using it and what they perceive as the obstacles to using social media. With respect to those who use social media, we specifically examined how they learned to use it, the ways they use it, how content is uploaded to the social media platforms, and presence of social media policies.

PIOs and departments with no social media use. Of the departments that do not use social media, they have considered using it in a one-way linear manner to post news/provide public affairs information (52.4%), provide crisis communication information such as evacuations, road closures, and shelter locations (35.7%), post agency incidents (31.0%), and keep employees informed (28.6%). At the bottom of the list were the two way-interactive options for social media: monitoring chatter about their agency (14.3%) and dialoging with the public (14.3%).

In addition to the numbers cited above, what might be even more worrisome is the fact that 17 respondents (40.5%) were in places that had never considered using social media. If these new media that are being adopted so readily by younger generations are not being adopted by emergency personnel, they run the risk of missing opportunities to contact their publics and also may end up with additional people in danger because of missed messages. On the flip side, emergency personnel may also miss opportunities to learn about situations while they are still small—before they turn into full-blown crises.

What these results reveal is a lack of knowledge about the capacity of social media. One of the reasons they are considered a transformative public relations tool is that they offer an opportunity for organizations to *interact* authentically with their publics. Social media amplifies traditional communication. The key is for those responsible for communication during crises to realize that not all media is equally skilled at meeting stakeholder needs. People are constantly looking for new pathways to information. Thus, the balance of power in controlling and disseminating information has shifted dramatically in the past decade as communication evolves from information centric to social centric (Edelman, 2012).

In departments with no social media use, we sought to understand the obstacles they perceived as preventing them from implementing a social media program. The three main obstacles were lack of command support, lack of time, and lack of information control. These were ranked in people's top two reasons most frequently with lack of time being listed 15 times (34.8%), lack of command support being listed 13 times (30.2%), and loss of information control being listed 12 times (27.9%). The remaining reasons included lack of personnel (25.5%), lack of familiarity with social media tools (20.9%), and concern over negative feedback from the public (13.9%).

PIOs and departments with social media use. A straightforward question asked PIOs to check all of the ways they had learned to use social media. Not surprisingly, most of them reported being self-taught through trial and error (89.0%). From a learning perspective, this process tends to produce long-term learning as opposed to the short-term learning associated with reading books (12.2%). Learning from others, such as colleagues (43.9%) and their children (14.6%), taking classes (20.7%), and online tutorials (14.6%) represented the midpoint on the learning scale because the PIOs have seen it in action and are thus better equipped to make smart decisions when they try it out for themselves.

Social media can be used by public information officers for a variety of reasons. In the case of these respondents, they use it for both internal and external communication purposes. For example, internally, social media have been used to keep employees informed (39.8%) and dialogue with employees (13.3%). Again, there is a nascent inclination toward using the medium

more as an information-dissemination mechanism rather than as a process for authentic conversation.

The vast majority of PIOs' social media use is external. The three top external ways in which PIOs use social media are to post news or public affairs information (88.0%), announce crisis information such as evacuations, road closures, and shelter locations (68.7%), and post agency incidents (72.3%). Each of these is a one-way, information-dissemination approach to using social media. It is as if the PIOs have taken the information that would typically be provided to the media through traditional channels and simply added social media as an additional way of getting the information to the proper media outlets.

Lastly, PIOs have used social media to monitor chatter about the agency (53.0%), dialogue with the public (36.1%), and recruit new employees (27.7%). Unfortunately, the ways PIOs use social media to execute their public relations functions, in comparison to the public information functions, is much more limited with half or less of them engaging in interactive social media usage.

When asked about the ways in which PIOs upload social media content, almost all of them reported using more than one means. A hardwired office computer was the most popular response (88.9%). The advantages of a hardwired computer include being able to create a firewall, monitor what is posted, and have a record of all of the official organizational communication. Unfortunately, using a hardwired office computer also means the public information officer has to be in the office as opposed to being out in the community where she or he can gather the latest information as well as build relationships with the public. A wireless laptop computer (75.3%) and handheld/mobile devices (70.4%) follow close behind. Given the increasing number of SmartPhones available, these numbers are likely to flip in the near future.

While they have the means to upload the content, their social media sites are more limited. First, their most used options were social networking sites such as Facebook, and microblogs such as Twitter, Plunk, and Tumblr (52 use each at least once a month; 69.3%). Second, they used YouTube and Viddler, video-sharing sites. The value of video-sharing sites is that they help the PIO offer a compelling (if not downright scary) story. If pictures are worth a thousand words, using sites such as these is an opportunity to convince those who may not otherwise evacuate to go to safer ground and leave their dwelling behind. Finally, the least-used social media include livecasting such as Ustream, social bookmarks such as Delicious, wikis, podcasts, message boards or forums, blogs, and photo-sharing sites such as Flickr.

While these departments appear to be on the cutting edge of using technology to communicate with the public, what is most interesting about their situations is that 55 of the departments (67.1%) do not have a written policy in place that restricts non-PIOs from using social media to relay departmental information. In organizations where policies and procedures, along with command and control, govern everyone's moves, the lack of written directives on the subject appears contradictory. Unlike a press conference or news release, social media know no boundaries when it comes to who can post what, when, or how. In this case, the difficulty of enforcing policies may be exactly what is driving their lack of existence in these organizations.

Use of Traditional Media

For RQ2, we conducted a series of *t*-tests on the various traditional media used by the departments who did and did not use social media. Interestingly, the only statistically significant difference occurred with respect to the use of a departmental website ($t = -2.337, p = .021$) for those who use social media ($M = 4.26$) and those who do not use social media ($M = 3.80$). Of the traditional media that they use similarly, the most often used are news releases, media advisories, reporter interviews, homeowners' association meetings, and public meetings.

With the exception of websites, departments that use and do not use social media are utilizing the same traditional channels for reaching the public. Clearly, departments that are blogging, tweeting, and Facebooking are more likely to be maintaining a website presence as well. What was more interesting about the findings in this area was that all of the other channels were being used at the same rate—why? If we think back to the shift from radio to television, we find a likely answer: people who are not early adopters of new technology still have to be reached. Social media, and websites, allow departments to reach a particular segment of their community and various publics. In this case, social media are not designed to replace other means of reaching publics; rather, they are simply another means to reach affected publics.

What was interesting and somewhat surprising about these findings was where press conferences fell on the importance list. That is, more departments are using meetings with homeowners associations and meetings with the public more than press conferences. Both meeting types create opportunities for dialogue between the department and the public, a generally superior way of interacting with the public instead of a linear, one-way model of communication. One of the other top modes for communication was interviews with reporters. Again, these interviews offer the possibility of dialogue rather than monologue and illustrate that they recognize the importance of building relationships with their various publics. Finally, text messaging was seen as the bottom of PIOs' preferred channels of communication. It may be because this method of communication does not allow for full explanations, or it possibly contradicts their move toward more conversation with the community.

Individual Factors

To address the last two research questions, we used logistic regression to predict which PIOs use social media at work. We can accurately predict 74.4% of the people who will use social media in their jobs based upon individual factors. The initial logistic regression called our attention to the following variables: education, age, status, sex, and engaging in creating social media content. Table 1 reports the findings from the logistic regression. One of the issues associated with logistic regression is that the $\text{Exp}(B)$ used to determine which factors increase the probability of predicting a particular behavior (social media use in this case), one needs to use interpretation rather than simply statistical significance. Extreme Wald statistics are frequently a result of small sample sizes rather than practical significance.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	EduR			5.080	2	.079	
	EduR(1)	1.452	.709	4.193	1	.041	4.271
	EduR(2)	1.521	.702	4.692	1	.030	4.577
	AgeR			5.624	5	.345	
	AgeR(1)	-.479	.898	.285	1	.594	.619
	AgeR(2)	.304	.835	.132	1	.716	1.355
	AgeR(3)	1.044	.852	1.501	1	.221	2.840
	AgeR(4)	.250	.789	.101	1	.751	1.284
	AgeR(5)	-.747	.808	.855	1	.355	.474
	StatusR(1)	1.164	.669	3.030	1	.082	3.202
	Sex(1)	.107	.594	.032	1	.857	1.113
	NMCreate	.480	.220	4.774	1	.029	1.616
	NMComment	.060	.236	.064	1	.800	1.062
	NMRead	.038	.222	.029	1	.864	1.039
	Constant	-2.840	1.052	7.291	1	.007	.058

a. Variable(s) entered on step 1: NMCreate, NMComment, NMRead.

Table 2: Individual Factors Influencing Social Media Use (Logistic Regression).

In this case, we chose to run an additional set of analyses after seeing the results. For example, almost all of the participants had either a bachelor’s degree or less than a bachelor’s degree so we ran non-parametric analyses to determine whether these large Wald and Exp(B) numbers were accurate representations. The follow-up analyses revealed that age, education and sex were not significantly different for those who did and did not use social media. It did reveal that sworn firefighter PIOs were more likely to use social media than civilian employees. Similarly, a set of follow-up *t*-tests did reveal that there is a statistically significant difference between those who do and do not use social media when it comes to reading ($t = -2.073, p = .041; M_{NoUse} = 3.16, M_{Use} = 3.63$), commenting on ($t = -2.322, p = .023; M_{NoUse} = 2.63, M_{Use} = 3.19$), and creating ($t = -3.731, p = .000; M_{NoUse} = 2.51, M_{Use} = 3.44$) social media content.

We initially looked at age, education, sex, and social media use at home, and status as the individual factors predicting social media use at work. From these variables, status as a sworn firefighter and use of social media at home were the only statistically significant predictors. So, why has previous research led us to believe that age makes a difference in social media use? In this case, we believe the reason may be how we chose to create our age categories. We attempted to maintain the age discriminations by keeping people together by decades. However, if we had split the ages into only two categories (under and over 45), we may have had different findings because 72.9% of the people in the 44 and under age group used social media at work and 59.1% of the 45 and older people used social media at work. Future research may need to come up with a better way of assessing age in relation to social media use for work.

In this case, the education distribution left no other coding options. We split the data based upon an associate’s degree or less, a bachelor’s degree, or a graduate degree. The thought was that people who were formally educated in a four-year program may be exposed to social media in a way that on-the-job training or as associate’s degree would provide. As we can see from the data,

that was not the case. While 70 percent of the people with a bachelor's degree used social media, this was not statistically significant. In the future, we need to take this into consideration and possibly be more specific about what they are exposed to during their formal education. At the outset, we indicated that men and women both use social media equally and that played out in the data. There were no significant differences between male (60%) and female (77%) PIO's use of social media at work.

What did make a difference was status. Sworn firefighters were more likely to use social media than civilian employees. Why might this be the case? One possibility is that firefighters who have been on the front lines recognize the importance of having a dialogue with the public. Similarly, they may have stronger relationships with the community members having been part of the community for a longer time. Finally, they may be less worried about the information control than a formally trained civilian PIO who is more focused on following the chain of command present in most militarily-run fire departments.

Organizational Factors

For RQ4, we can accurately predict 77.4% of the people who use social media in their jobs based upon organizational factors. The initial logistic regression called our attention to the following variables: whether the person has exclusively PIO duties, departmental size, PIO training, time in current position, and time with department. Again, we approached these results with caution and opted to run follow-up chi-square analyses.

The follow-up nonparametric analyses revealed more similarities than differences. For example, the PIO training questions asked about training in one's own fire department, in another fire department, at an outside agency, and any other PIO training one had received. The lopsided numbers for each of these were likely the reason for the initial high Wald and Exp(B) numbers. That is, only training within one's fire department had a relatively equal split between people who had (65) and had not had it (63). Yet, the follow-up Mann Whitney test did not reveal statistically significant differences between the two groups. Similarly, follow-up analyses for time in current position, time as a PIO, time in current department, and department size revealed no statistically significant differences. Non-parametric analyses for assignment ($p = .001$) did reveal statistically significant differences between what would be predicted by chance and what was found in these data with full-time PIOs using social media more even though there were fewer of them in the sample. Overall, full-time PIOs are more likely to use social media than people who have PIO and other responsibilities combined. Also, there are no statistically significant differences in social media use based upon PIO training, time in your current position, department size, and time as a PIO.

Of all four research questions, this turned out to be the most perplexing. With the exception of the differences between full-time PIOs and firefighters who have PIO responsibilities, none of the organizational factors impacted a department's use of social media. On the positive side, this means that any department could implement social media if desired. Department size, amount of training provided to PIOs, time in current position, time as a PIO, and time with the department do not serve as significant predictors of social media use. Intuitively, it makes sense that those who are full-time PIOs are more likely to use social media. When you have to split your time

between fighting fires and providing the public with needed information, there is less time to become an advocate for the technology, to become trained in how to achieve the best results, and to find the extra time needed to use another communication channel during a crisis situation.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a						
AssignR(1)	2.440	.794	9.451	1	.002	11.469
SizeR			.751	2	.687	
SizeR(1)	.294	.597	.243	1	.622	1.342
SizeR(2)	-.569	.984	.335	1	.563	.566
PIOExpR			3.875	4	.423	
PIOExpR(1)	-.802	1.093	.539	1	.463	.448
PIOExpR(2)	-1.046	1.034	1.023	1	.312	.351
PIOExpR(3)	.340	1.291	.070	1	.792	1.406
PIOExpR(4)	.967	1.057	.837	1	.360	2.630
CurrentR			3.568	4	.468	
CurrentR(1)	1.781	1.177	2.288	1	.130	5.934
CurrentR(2)	1.156	1.318	.769	1	.380	3.176
CurrentR(3)	.284	1.386	.042	1	.838	1.328
CurrentR(4)	.431	1.201	.129	1	.720	1.539
DeptR			6.377	6	.382	
DeptR(1)	2.152	1.139	3.572	1	.059	8.601
DeptR(2)	1.647	1.123	2.150	1	.143	5.190
DeptR(3)	.757	1.178	.412	1	.521	2.131
DeptR(4)	.182	1.114	.027	1	.870	1.199
DeptR(5)	1.107	1.338	.685	1	.408	3.026
DeptR(6)	.518	1.182	.192	1	.661	1.678
PIOTrainD(1)	.446	.546	.666	1	.415	1.562
PIOTrainAD(1)	.435	.635	.468	1	.494	1.544
PIOTrainA(1)	-.788	.778	1.024	1	.311	.455
PIOTrainO(1)	.254	.758	.112	1	.738	1.289
Constant	-2.412	1.565	2.375	1	.123	.090

a. Variable(s) entered on step 1: PIOTrainD, PIOTrainAD, PIOTrainA, PIOTrainO.

Table 3: Organizational Factors Influencing Social Media Use (Logistic Regression).

CONCLUSION

The most striking conclusion of this exploratory study is that fire departments do not understand the ubiquitous power of social media and are underutilizing it for inappropriate reasons (lack of training, time and resources). Indeterminate of whether they employ social media, the evidence indicates that currently, social media is not implemented strategically at the departmental level, nor is it seen as a “game changer” in emergency communications, even though multiple examples indicate the overwhelming power of social media to inform, help, and direct during an emergency (American Red Cross, 2010; Chavez et al., 2010; Fugate, 2011; Heinzelman & Waters, 2010; and Woodbury, 2010). It is recommended that fire departments review the

executive summary and conclusions from the *Social Networking for Emergency Management and Public Safety Conference* sponsored by the U.S. Department of Energy and Battelle in August 2010 in Seattle, Washington, which was attended by the heads of emergency management teams from across the country. The executive summary offered the following:

- Agencies have to trust the public on some level to manage emergencies. All emergencies are local, and public.
- More needs to be studied in regards to how crowd sourcing leads to robust decisions. Experts in general tend to struggle with the concept that people are turning more and more online to a fan base to help guide their decisions.
- Deferring the release of information is no longer an option. Social media tools can be used; they are being used and used well in the emergency management community. Agencies must consider the ramifications (staffing, resources, control of information) when joining the social media conversation.
- Public demand and competition, even among government agencies, will drive the data. One city cannot afford to remain silent when others are openly sharing.
- People want information, and they expect it immediately. The challenge will be balancing resources and accuracy against the need to produce instant information.
- Government agencies may have to change policies, practices, and skill sets to use effectively social media. They will need to use new terms like branding and dialogue. They may also need to partner more broadly (http://www.au.af.mil/au/awc/awcgate/pnl/social_networking.pdf)

While descriptive in nature, this study reinforces previous literature as well as provides a baseline for additional research on organizations that do and do not have a social media presence. Based upon the findings, three overarching conclusions can be drawn. First, surveyed fire departments are not utilizing social media, nor do they understand the benefits of using social media in an emergency. Second, the obstacles to implementing social media have not been overcome even by those who are currently using it. Third, there is a distinct difference in attitudes toward and experiences with social media between those who use it at work and those who do not.

Limitations and Future Research

As is the case with most research studies, hindsight is an amazing tool. While the sample was not as large as some may desire, it does closely approximate the number of males and females in these positions across these types of organizations. Similarly, the sample represents the full spectrum of department sizes, civilian vs. sworn firefighter roles for PIOs, and length of time as a PIO. Future researchers should strive to represent more effectively the geographical differences as there may be significant differences between firefighters dealing with wildfires and those who are in urban areas dealing with fires that can spread across closely aligned buildings or those dealing with fires sparked by lightning in rural areas.

In addition to strengthening the sample's diversity, future research should consider to what extent does social media use impact people's perceptions of the organization positively or negatively.

Finally, future research needs to take a much closer look at the importance of curation of social media during emergency-response situations. As was evident in this study and others that came before it, emergency responders and PIOs are much more comfortable using social media for information-dissemination purposes, but AST suggests that the traditional one-way model of information dissemination is no longer viable because new technologies have made communication during a crisis boundary less. Future studies may want to approach social media usage through the lens of Adaptive Structuration Theory focusing on identifying the processes through which structures, rules, and functionalities are co-created and maintained in order to support a new system of emergency communication. Researchers and practitioners would benefit greatly from a better understanding of what needs to be done to capitalize on the interactive, dialogic nature of social media. This may involve extensive training to help PIOs learn how to use the new technologies effectively, and to understand and appreciate the value of building relationships through authentic conversations with the public as a way to enlarge and increase emergency response effectiveness.

Implications

One of the implications of this study is that the traditional responsibility of PIOs—to disseminate information that has been vetted and approved by the Incident Commander—is changing. It is expanding to include the non-traditional job of connecting with important publics through social media channels. As Wright and Hinson (2009, p. 25) note, “More than half of all internet users have joined a social network, social networks have become the number one platform for creating and sharing Internet content and nearly 75 percent of all Internet users have read a blog. More people now get their news online than from traditional mass media even though many people blend online and traditional mass sources in their quest for news and information.”

A second implication of this study is that the main perceived obstacles to full adoption of new media technologies are lack of time, lack of information control, and lack of support from the command staff. These are not unusual obstacles for what can be perceived as a total disruption of the time-tested command and control system of disseminating information that has been perfected by fire departments for decades. Fire departments across the country, however, know that what has worked in the past is no longer sufficient going forward. Traditional communication channels must be augmented with new, unregulated and unsupervised channels, which is code language for “loss of control.” While some fire departments may be a little slow to ramp up to the new technologies available, there is a quiet recognition that sooner, rather than later, PIOs will have to incorporate social media into the mix, or risk becoming less credible sources of important information in emergencies.

To do it right will take time and additional personnel. Those PIOs who have incorporated social media into their department’s mix of communication channels indicated that social media can take an enormous amount of time during an emergency. In effect, someone has to monitor the social networks 24/7 during and after a crisis. If a PIO has to split time with other duties beyond managing communication, the social media component receives less attention than what is required to be effective.

Training is another area that could make an enormous difference for PIOs. Currently, the vast majority of PIOs who use social media learned it on the job or from personal interest. (One respondent even acknowledged that his teenage son taught him how to use social media!) Fire departments need to invest in regular, mandatory training in social media technologies for their communication personnel. The benefits will help PIOs to serve the community better. In fact, Kent and Taylor (1998) point out that the potential for dialogue between an organization and its public is one major benefit of the Internet.

While the vast number of social networks make it more difficult to manage and control information dissemination, they also offer two-way symmetrical communication that fosters mutual understanding, provides immediate feedback, and enhances authenticity, accountability, and transparency—all important attributes for excellent public relations and public information credibility (Wright & Hinson, 2008). Fire departments have important and serious jobs to do. They save lives by putting out fires, rescuing people, and by providing timely safety information for the public, which is why communication should never be an either/or debate. There is room for both command and control *and* social media in the fire department.

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