

SOURCE CREDIBILITY AND THE PERSUASIVENESS OF
PUBLIC SAFETY MESSAGES COMMUNICATED VIA SOCIAL MEDIA

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PUBLIC SAFETY MESSAGES COMMUNICATED VIA SOCIAL MEDIA

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ABSTRACT

Social media communication networks such as Twitter and Facebook are changing the way organizations and communities alert the public of timely public safety information related to natural disasters, man-made events or other crises. The informal nature of social media can create conflict between “official” organizational sources and individual sources.

This quantitative study sought to understand whether organizational sources are more credible and persuasive than individual sources during times of crisis.

110 adult residents of a suburban Texas community were asked to view simulated public safety messages presented within a social media channel, and then complete a short survey assessing the credibility and persuasiveness of the messages they viewed.

The 2x2 factorial post-test only experiment found that within social media, organizational sources are significantly more credible, $F(1, 108)=40.62, p<.001$, and significantly more persuasive, $F(1, 108)=9.4, p=.003$, than individual sources when communicating timely public safety information, regardless of message content. When the results were controlled other factors such as perceived risk, attitude and user involvement, organizational sources were still found to be significantly more credible than individual sources, but not significantly more persuasive. Alerts that were perceived

to be more credible were also perceived to be more persuasive, regardless of source, $r(108) = .382, p < .001$.

The findings of this pilot study offer rich opportunities for future research in the area of source credibility within social media, and should provide valuable information for practitioners responsible for communicating with the public in times of crisis.

INTRODUCTION

Public safety professionals and organizational leaders are increasingly turning to social media channels to communicate public safety news and information to the public. While social media are an effective channel for organizations to reach the public during a crisis, the proliferation of user-generated conversation and interaction that occurs within these networks introduces a number of issues that are not typical of traditional one-way public safety communication channels.

Changes in media technology have made the job of public safety communication more difficult. Factors including the decline of local broadcast news programming, decreased use of home land-line phones, and increasing competition for audience attention have made it more difficult to communicate directly to citizens in a timely manner (Spence, Lachlan, McIntiryre & Seeger, 2009; Beebe, 2004). Because of these and other factors, public safety organizations are moving their communication systems online.

While the use of social networks by public safety agencies is a positive step toward engaging in public dialog, it is not without its challenges. During a public safety crisis, social media networks give users equal access to official news sources and user-generated news and comments simultaneously. In the social media there is no longer one official organizational source of public safety information. Users must make their own judgments about the relative credibility or organizational and user-generated information and decide for themselves which information is the most credible and actionable to

protect their safety. Unfortunately, research has not kept pace with changes in new technology and no study exists that has examined credibility of social media messages posted by different source types, such as safety protection agency personnel versus an ordinary citizen.

The purpose of this study is to understand how the source of a message affects the credibility and persuasiveness of a public safety news alert communicated in social media. This experiment examined the effect of source on the credibility and persuasiveness of public safety messages communicated via social media. There were two independent variables, message source, and message content. The method was a 2(source) x 2(message) factorial design. The independent variables of credibility and persuasiveness were measured between subjects.

This study will expand the body of academic research about source credibility by examining whether prior findings apply to timely public safety news alerts communicated in the social media. The research may also provide valuable insight for practitioners responsible for organizational and municipal emergency communication systems.

The overarching research question that guides this study is: *What is the effect of source type on source credibility and persuasiveness of public safety news alerts posted in social media?*

LITERATURE REVIEW

Social Media

Social media, as a concept, has been defined as “a group of Internet-based applications which allow the creation and exchange of user generated content” (Kaplan & Haenlein, 2010, pg. 2). Metzger and Flanigan (2009) identified social media as a system in which “individuals engage in wide-scale communication, collective resource building, and collaboration online.” (p. 415).

One key theme that several authors have used to distinguish social media from more traditional media is that social media networks foster interactive conversations among an audience, rather than one-way flow of information. (Paun, 2009; Kaplan & Haelein, 2010).

Many social media researchers believe the technology provides positive opportunities to expand access to information and foster sharing and collaboration. (Smith, 2010; Kushin & Yamamoto, 2010). However, it has also been noted that the technology has the potential to undermine traditional authorities, and to spread rumors (Flanigan& Metzger, 2008; Huiling & Jingwen 2010). This may be because the organic flow of user-generated communication within social media networks moves at a faster pace than traditional organizational communication channels, and without the requirement of fact-checking for accuracy (McCaffrey, 2012). The implication is that during a public safety crisis, official organizational communication may not be able to keep pace, and contribute to the public dialog in a timely way.

Public Safety Communication Systems Outdated

Changes in the way the public uses mass media and interpersonal communications technology are impacting the effectiveness of traditional emergency communication systems. Traditional emergency communication mechanisms have included telephone alerts, radio broadcasts and mainstream news reports (Emergency Communications Outdated, 2008). The Government Accounting Office issued a warning that emergency service agencies “Provide messages over television and radio, but do not transmit messages via other communications devices that Americans routinely use, such as cell phones, personal digital assistants, and computers” (p. 3)

Local emergency radio broadcasts have been a long-standing part of emergency and public safety communication networks, because radio content has traditionally been generated locally and radio stations require less electricity to run and are typically more resilient than television stations during natural disasters (Spence, Lachlan, McIntire & Seeger, 2009). However the trend towards consolidation of station ownership, increased automation and syndication of programming, and the reduction in the broadcast day has made local radio stations ineffective as a medium for timely local emergency communications. Spence, Lachlan, McIntire and Seeger recently concluded that “radio stations are not well prepared to serve the public during a crisis” (p. 147).

The traditional method of sharing emergency communications via land line telephones is also being called into question. The simple issue of access is becoming a problem, as a quarter of homes now rely solely on mobile telephones (Blumberg & Luke, 2010), and do not have access to traditional “reverse 911” systems. Beyond that,

telephone systems can take too long to reach a population if the physical infrastructure of an emergency operations center is not sufficiently robust. Following a 2002 chemical spill in North Dakota, researchers discovered that system overload caused the emergency phone system to fail, and, and identified a need for “backup emergency systems for crisis situations” (Beebe, 2004, p. 25).

Faced with these and other challenges, many communities have implemented a variety of short messaging service (SMS) text message and social media communication systems in an effort to communicate with residents (Connell, 2008; Emergency Communications Outdated, 2008). However the effectiveness of these systems is largely untested. For instance, changes in communication technology have altered the dynamics of news diffusion, and researchers have begun to recognize a trend toward increasing reliance on interpersonal communication rather than broadcast news reports (Glascock & King, 2007; Kanihan & Gale, 2003).

The advent of the cellular telephone and the internet have increased the capability of people to communicate interpersonally over large distances. One of the first studies to document the importance of cellular phones in sharing timely news was in 2002, when E.M. Rogers and Seidel (2002) discovered that 14 percent of respondents learned of the terrorist attacks of September 11, 2001 by cellular telephone. The importance of personal electronic communication has increased markedly in the last decade, and was reported as the leading source of information (72%) for the Shuttle Columbia disaster in 2003 (Glascock & King, 2007). The complex relationship between mass media and interpersonal communication cannot be understated. Although interpersonal

communication is often a primary source of information, it is also drives the majority of subjects to seek additional information from broadcast media (Gantz, Kendl & Robertson, 1986).

It is not only computer technology, but the mobility of that technology, which has had the greatest impact on information sharing. In a quantitative study of new diffusion following the terrorist attacks of September 11, 2001, only 2% of respondents learned about the attacks via the Internet (Kanihan et. al., 2003). However six years later Smith (2010) found that following the 2009 Haitian earthquake, “moments following reports of the earthquake, social media users flooded Twitter, posting queries about relief efforts, and establishing an online dialogue”. The difference between the role of computer mediated communication in these two studies may be attributed to the development of mobile technology, which allows users continuous access the internet via smartphones and mobile internet devices.

In crisis events it appears that certain people act as thought leaders, spreading information to multiple people – as many as 50 according to one study (Roger, 2002).

Although quantitative research on the impact of mobile technology and social media and news diffusion are limited, a number of case studies and content analyses in the literature document their rising importance. The 1989 California earthquake, for example, was a wake up call for emergency managers. Case studies published following the disaster cautioned emergency managers to acquire cellular phones and organize phone trees as part of their crisis management plans (Kearn-Banks, 1994).

Social media and mobile technology were one of the primary means of communication following the 2009 earthquakes in Haiti. In a 2010 content analysis of more than 1,400 twitter “tweets,” Smith (2010) concluded that “organizations can use social media to increase interactions with publics through a steady stream of inputs and outputs” and build “mutually beneficial relationships.

Mobile technology and social media give the public a greater opportunity to participate in interactive dialog about public safety and emergency communications. This type of informal participation in the dissemination of information has been termed “distributed public relations” (Kelleher, 2009).

At the time of this writing, many major public safety agencies including the Federal Emergency Management Agency (FEMA), the US Chemical Safety Board (CSB) and the National Institute of Health (NIH) have established public accounts with social media services such as Twitter and Facebook (Twitter Analytics, 2011).

Some researchers believe that social media and mobile technology have the potential to expand the breadth and speed of public safety communication. This is because of features of these media that allow users to quickly forward or “retweet” messages to large groups of people within their social network. However this theory has not been empirically tested (Schultz, Utz & Goritz, 2011).

Source Type Defined

Communication research has demonstrated that information published by an organization is perceived differently by an audience than information published by an individual or private citizen. Some of the reasons suggested include the relative level of

perceived expertise, and the expectation that an organization will employ some form of review process or quality check on published information (Poorisat, Detenber, Viswanathan & Nofrina, 2009).

The literature provides numerous examples of studies that employ a discrete independent variable that describes the source of published information as either individual or organizational. (Poorisat et. al., 2009; Stevens, 2008).

Source Credibility Defined

Credibility has been the subject of extensive research from the earliest years of communications research. At its most basic level, credibility is a measure of how believable a message is. Researchers have categorized the key components of credibility to include source credibility, message credibility and medium (or channel) credibility. (Metzger, Flanagin, Eyal, Lemus, & McCann, 2003).

Early researchers Hovland, Janis and Kelley (1953) defined source credibility as “the extent to which a communicator is perceived to be a source of valid assertions” (p. 21). The two primary dimensions of source credibility typically measured are expertise and trustworthiness (Farr, 2007). Expertise is more associated with logos, describing the extent to which a source is seen to be knowledgeable and qualified to provide accurate information. Trustworthiness is more associated with ethos, describing a source’s visceral rapport with an audience, and the degree to which the source’s motivations are perceived to be in the audience’s best interest (Pornpitakpan, 2004).

Persuasion Defined

Persuasion is a social science research term which has become a key outcome variable measured in advertising and public relations research. It is broadly defined as “change in attitudes or beliefs based on information received from others.” (Rashotte, 2006).

The process of persuasion was first defined by social science researchers. It presumes that a stimulus, once processed by a subject, will first influence attitudes and beliefs, which will ultimately lead to a change in behavior (Sheth, 1974). This process is codified in the Theory of Reasoned Action. (Fishbein & Ajzen, 1975).

Over time a more complex picture of persuasion emerged. Communication science researchers identified different processing models of persuasion depending on the level of engagement a subject dedicates to the persuasive stimulus. This layered approach is outlined in two models – the Elaboration Likelihood Model (ELM) and the Heuristic-Systemic Model (HSM) (Poorisat et al., 2009). Under these models, when a subject is motivated to evaluate persuasive stimulus, processing occurs through a “central” process. When a subject is unmotivated, peripheral processing occurs. Researchers have determined that persuasive effects operate differently depending on the level of processing or elaboration (Areni, 2003).

The Link Between Source Type and Credibility

The literature suggests that source type will have an impact on the dimensions of credibility. The link between “officialness” and credibility has been well documented throughout the history of communication literature (Pornpitakpan, 2004). This can be partially explained by the components of credibility, which are expertise and

trustworthiness. Presumably organizational sources are recognized as more expert than users, and because of their official standing they are seen as more trustworthy (Farr, 2007). Poorisat et. al (2009) compared expert-generated and user-generated websites and found that expert-generated sites had a higher level of overall credibility. It is reasonable to expect that this will be the case within the social media as well.

The literature notes that our construct of credibility was defined during an era of more traditional, one-way communication. Traditional credibility measures assume a gatekeeping model, with “high barriers for access to information and dissemination tools” and where “system gatekeepers have a vested interest in maintaining credibility standards.” (Metzger, Flannigan & Medders, 2009). In the social media space where there are low barriers to entry and no gatekeepers, credibility can be more difficult to define and ascertain. A 2008 study found that the majority of internet users verify the information they find online only “rarely” or “occasionally.” (Metzger & Flannigan, 2008).

When researching social and online media, the link between “officialness” and credibility has not always been as closely linked. There are some indications that social media users tend to be less trusting of official sources. In fact, some researchers have gone as far as to suggest that in social media official sources are less credible than users (Wigley & Fontenot, 2010; Westerman, Spence & Van Der Heide, 2012). Studies of online news reporting have found user-generated information to be equally credible as official sources in some conditions. (Beaudoin & Thorson, 2005; Lee, Park, Lee & Cameron, 2010).

Engaging in communication via social media tends to be a low-elaboration activity, and as a result users tend to evaluate credibility using heuristic cues such as visual evaluation and surface characteristics. (Fogg, 2003) Because of this, perceived differences in credibility tend to be less distinct. A 2008 study found “no significant difference in perceived credibility between user- and expert-generated content site.” (Poorisat et al., 2009).

While involvement of the public in sharing timely news has many benefits, it can also create challenges for organizational communicators. News from informal sources can often be incorrect or incomplete, yet it spreads quickly and can be difficult to correct. Studies show that user generated content can be equally as credible as organizational communication or official news reports (Beaudoin & Thorson, 2005; Lee, Park, Lee & Cameron, 2010). In addition, during a crisis the news media is more likely to use citizen-generated content as a source in news reports than reports by official sources (Wigley & Fontenot, 2010).

These findings underscore the importance for organizational communicators and official sources to engage quickly and accurately in mobile communications and social media, to ensure that timely and accurate information is available to the public. They also call for a greater empirical understanding of the speed and effectiveness of mobile technology and social media in the diffusion of news.

The Link Between Credibility and Persuasion

The link between credibility and persuasion has been well documented over time, beginning with Hovland & Weiss (1953), who found that credible public speakers were

more persuasive than their less credible counterparts. The research was further validated by Heesaker & Petty (1983). The link between credibility and persuasion was seen to be the most pronounced when messages were highly relevant and personal in nature (Petty & Caci, 1981).

The link between credibility and persuasion is well documented under a variety of conditions (Pornpitakpan, 2004). In a critical review of source credibility research, Pornpitakpan made the point that source credibility, and particularly its relationships with persuasion, has been extensively studied. The author went as far as to suggest that, “Studies that employ source credibility as the only independent variable should be discontinued,” however also noted that studies which considered source credibility in the context of risk communication and media modality were areas that had not been extensively studied and called for more investigation. (Pornpitakpan, 2004).

The Elaboration Likelihood Model and the Heuristic-Systematic Model are identified as mechanisms to explain the ways in which source credibility impact persuasion. When elaboration is low, source credibility plays an important role as a “heuristic” or cue to prompt a subject to accept a persuasive message. When elaboration is high, source credibility becomes one of a number of factors that are considered as part of information processing (Tormala, Briñol, & Petty, 2007).

However some scenarios created counter-intuitive results and should be examined. For example, in situations where there was similarity between the source and the recipient, sources with high credibility and low trustworthiness were found to be less persuasive (Feldman, 1984). This study could have application to social media because

user-generated social media content is by definition a situation where there is similarity between source and recipient. This finding could suggest that in social media, expert-generated content with perceived high levels of expertise could be less credible.

Another study worth noting found that during situations with high levels of time pressure, the effect of source credibility on persuasion was weakened (Higgins, 1999). Reynolds found that during high risk situations the more interpersonal trustworthiness element of credibility was more important than expertise in persuading the public (Reynolds, 2011). Public safety news alerts tend to be very timely, and the nature of social media communication lends itself to quick evaluations and low levels of elaboration. This research finding may suggest that public safety news in social media will demonstrate a weaker link between credibility and persuasion.

A review of the relevant literature suggests that in many situations source type can have an impact on the dimensions of credibility, and on the persuasiveness of messages presented by those sources. The link between source type, source credibility and persuasion has not been studied as it relates to social media, but these questions have a significant bearing on the future direction of public safety communication systems. Based on a review of the literature, the following hypotheses were developed.

H1: Public safety news alerts from organizational sources will be perceived to have higher levels of credibility than individual sources.

H2: Public safety news alerts from organizational sources will be more persuasive than alerts from individual sources.

H3: Public safety news alerts perceived to be more credible will also be perceived to be more persuasive, regardless of source.

Limitations of the Existing Literature

From this review, the concepts of source credibility and persuasion have been well studied. An increasing number of studies have been conducted in recent years evaluating various aspects of source credibility and persuasion within the social media space. They manipulate variable such as source, message modality and visual presentation, and measure outcomes such as credibility, response and likelihood that a message will be shared across social networks. Typically these studies have been associated with research areas in advertising, online communication and journalism (Beaudoin & Thorson, 2005; Lee, Park, Lee & Cameron, 2010).

The existing literature is limited in the area of emerging media technology. Few, if any studies have examined whether these traditional relationships between source, credibility and persuasion are applicable in the context of the social media environment. This study proposed to examine those questions, with an aim to expand the current body of research on the topics of source credibility and persuasion.

RESEARCH METHOD

This experiment examined the effect of source on the credibility and persuasiveness of public safety messages communicated via social media. There were two independent variables, message source, and message content. The method was a 2(source) x 2(message) factorial design. The independent variables of credibility and persuasiveness were measured between subjects. This was a cross-sectional study, meaning that participants were observed at a single point in time, rather than over an extended period. In accordance with tried and true principles of experiments, participants were randomly assigned to a treatment or condition.

We included two repetition factors by 1) varying the source of the messages and 2) varying the content of the messages. By using a combination of testing between-subjects we will accomplish the survey design using four randomly selected conditions.

Table 1: Experimental Design: 2 x 2 Factorial Design with Repetition Factors

Between Subjects		
Condition	Source	Message
1	Organization	Chemical Spill
2	Organization	Tornado
3	Individual	Chemical Spill
4	Individual	Tornado

Participants

All subjects were treated in accordance with the rules and policies of the University of Missouri – Columbia Institutional Review Board (IRB).

This pilot study used a convenience sample rather than a random sampling protocol, so the results cannot necessarily be generalized to represent a larger population. 110 adult (>18) participants from The Woodlands, Texas were recruited to participate in the study via pay-per-click ads placed on social networking sites. The sample population was drawn from the general population of 122,820 Facebook users aged 18 or older who reside within 25 miles of The Woodlands, Texas. See *Appendix C* for recruitment advertising data.

Based on an online power analysis conducted using software from the University of Iowa, it was determined that sub-group sample sizes of 27 or more would meet our stated statistical significance goals of 95% significance level and 80% statistical power (Lenth, 2009) for a total sample size of about 108.

According to Wimmer & Dominick, “Samples with 10-50 subjects are commonly used for... pilot studies” (p. 101). A recent exploratory study on new media used randomly assigned treatment groups of approximately 30 subjects to test for credibility and believability (Lee, et al., 2010). These examples provide rationale for selecting a sample size of 27 for each treatment group in this study.

The present study targeted social media users from The Woodlands, Texas by recruiting exclusively within online social networks using a specially prepared and coded

website. The geographic advertisement targeting features of the pay-per-click advertising service limited the geographic reach of the survey to select zip codes within the target community of The Woodlands. As such, self-identifying demographic questions were not needed to ensure the accuracy of the sample.

The participants reviewed a consent form before clicking “I consent” to participate in the study, and they were not compensated for their participation.

Independent Variable (Source Type)

The independent variable manipulated in this study is the type of the source that is distributing a public safety message through social media. The source type variable was operationalized as a discrete variable which will either be an organizational source or an individual source.

To reinforce the authenticity of the study, the organizational and individual sources represented will be actual organizations that operate within the same geographic market as the subjects. However to control for historical bias, we measured user attitude toward the organizational source as a control variable. In addition, participants were randomly assigned to treatment groups to control for bias.

The organizational source cited was the Montgomery County Office of Emergency Management. To control for any preconceived attitudes or perceived credibility toward individuals in the photos, the individual sources were fictional (as opposed to known) individuals. (See Appendix B for examples of stimulus materials)

Independent Variable (Message Type)

A second independent variable of message type was used to create a repetition within the study. One of two different versions of the public safety message were randomly assigned to subject groups.

One message related to a natural disaster (tornado warning) while the second message related to a man-made emergency (a chemical spill on a local road). The two different types of public safety message were intended to test the strength of the relationship between source and credibility in a variety of different emergency situations.

Dependent Variables

The dependent variables of credibility and persuasion were measured by a posttest survey. Source credibility was measured using a 15 question semantic differential scale that evaluated both dimensions of credibility – expertise and trustworthiness. This scale, created by Ohaninah (1990) has been shown to be reliable with an alpha score of 0.90.

Table 2: Ohaninan (1990) semantic differential scale for credibility

Dependable	Not Dependable
Honest	Dishonest
Reliable	Unreliable
Sincere	Insincere
Trustworthy	Untrustworthy
Expert	Not Expert
Experienced	Inexperienced
Knowledgeable	Unknowledgeable
Qualified	Not qualified
Skilled	Unskilled
Credible	Not credible
Unbiased	Biased
Believable	Not believable
Truthful	Untruthful
Reputable	Disreputable

This measure of credibility is similar to that used in other studies measuring the credibility of online news sources (Lee, et al., 2010; Kioussis & Dimitrova, 2006; Meyer, 1988).

Persuasion and behavioral intent were measured by a series of two questions which were evaluated on a five point scale of likelihood, with a rating of one being “very unlikely” and a rating of five being “very likely.” The current study draws on existing measures of persuasion and behavioral intentions. Typical measures of persuasion in advertising and public relations research may include measurements of attitude, memory, purchase intention or purchase behavior (Rodgers & Thorson, 2012). This study will measure persuasion as the subject’s implied engagement with the public safety message presented, and the likelihood that they will share the message with others. Behavioral intention is a construct of persuasion that has been used in earlier studies in an online advertising and eWOM context, so it is appropriately adapted to the present study (Rodgers & Bae, 2005). The questions will evaluate: “What is the likelihood that you will “retweet” this information? “What is the likelihood that you will share this information online in a format other than twitter?”

Persuasion as sharing is appropriate in the social media environment, because the culture of the social media audience is active, and sharing is an implicit part of the media consumption experience for social media users (Gallant & Boone, 2011).

To aid in data analysis, where necessary, survey items were reverse coded so that greater responses indicate a positive response and lesser responses indicate a negative response.

Stimulus Materials

Each of the four treatment groups were presented with computer screen shots of a “twitter” feed from one of four sources. The screen shots were digitally manipulated twitter accounts for either the “Montgomery County Office of Emergency Management (Organizational Source) or “Jen in the Woods” (Individual Source). The number of “followers” and “following” for each of the two sources was the same, so that the relative perception of source credibility will not become a confounding variable.

The subjects saw two different twitter messages dealing with both man-made and naturally occurring pressing public safety emergencies in the community which require timely action. Specifically, they will involve a tornado warning, and a chemical spill on a local road. In both cases, residents within a specific geographic area will be urged to shelter in place for safety.

The use of two different sources as well as the use of two different messages, provided a repetition factors to improve the validity of the study.

The experimental design controlled for the potential confounding variable of perceived risk, because researchers have found perceived risk can be a factor affecting the credibility and persuasiveness of a message (Reynolds, 2011). The survey questionnaire asked participants to rate the perceived risk posed by the stimulus message, using a perceived risk scale developed by Elvik & Bjornskau (2005), which has been found to be closely correlated to actual statistical risk.

Although each social media message contained the same hyperlink (implying that more information is available), participants could not click through the link for more information because it was not activated.

Prior to conducting the research each of the four stimulus materials, as well as the survey instrument, were pretested with an independent focus group to gather user feedback on the survey experience and address any issues with terminology. As a result of focus group feedback, a second repetition factor was removed from the study as participants found the original survey too long. In addition, focus group feedback suggested removing repetitive questions and unnecessary demographic questions.

Manipulation Check

A manipulation check was conducted to ensure participants were aware of the source of the stimulus messages they viewed. This was extremely importance since the identification of message source was central to the premise of the study. Participants were asked with both unaided recall and aided multiple choice questions to recall the source of the stimulus messages they viewed.

Procedure

Participants were recruited exclusively via social media networks to participate in the study, which ensure that all participants were familiar with social media. Participants were asked to complete an informed consent form. The pay-per-click advertising service only delivered ads to users within a specified zip code and age range, so we were able to ensure that all participants are social media users and residents of the specified geographic area (The Woodlands, Texas). Once prescreened, participants were randomly

assigned to one of four treatment groups. The random assignment to treatment groups controlled for selection bias (Creswell, 2009). The subjects used their own computer hardware (the survey was enabled for computers, or tablets and phones using the iPhone or Android operating systems) to access a website which showed them in turn, a stimulus, and then a short survey. The survey asked the subjects to assess the credibility of their stimulus material, and whether or not they would pass along the information by “retweeting” it for view by others in their network.

Controls

A number of controls were added to the experimental design to eliminate bias and control for confounding variables. The control variables used in the study were perceived risk, attitude and involvement.

To control for perceived risk, we chose to use a measurement scale developed by Elvik & Bjornskau (2005). A question using this scale was added to the survey instrument to determine the level of danger subjects associated with the stimulus materials presented. After reviewing ten different models of measuring a subject’s perceived risk, Elvik and Bjornskau concluded that a four point scale resulted in the greatest correlation between perceived and actual statistical risk. For the purpose of data analysis, the researchers assigned the logarithmic values of 0.01 to the rating of “very safe” and a rating of 10 to the rating of “very unsafe” to account for “the fact that human perception of physical magnitudes is logarithmic and tends to underestimate differences in magnitude of risk” (Elvik & Bjornskau, 2005). A question was included in the research questionnaire asking subjects to identify the perceived risk they feel resulting

from the stimulus message. During data analysis we reviewed the impact of perceived risk on credibility and persuasiveness, to control for any confounding effect.

To control for user attitude toward the source of the messages presented we incorporated a series of questions created by Muehling (1987) that were shown to have an alpha of 0.97. The questions were incorporated in the survey instrument prior to any discussion of the dependent variables of credibility or persuasion.

To control for user involvement the survey instrument included a series of questions designed to determine whether participants had truly paid attention to the stimulus materials. User involvement was measured using a scale originally designed by Laczniac, Russell & Darrel (2003) to measure user involvement with advertisements. The scale has been shown to have an alpha of 0.97. As an additional control on user involvement, we conducted a manipulation check to determine whether subjects could recall the source of the stimulus message.

Data Analysis

Descriptive statistics were run for all dependent and control variables. A principal component factor analysis was conducted along with an alpha analysis to determine the reliability of indexed variables. Hypothesis testing for hypotheses 1 and 2 was conducted using a series of one-way ANOVAs. In addition, the effect of control variables was measured using a MANOVA analysis. Hypothesis 3 was tested via a correlation analysis. Additional testing included a review of correlations between control variables and dependent variables.

RESULTS

The data analysis for this study consisted of data preparation, a manipulation check, the development of descriptive statistics, hypothesis testing, and additional testing.

Data Preparation

In preparation for conducting analysis, the data was “cleaned”. Any data that was missing or that was mis-keyed (such as putting a 7 where a scale was 1-5) was changed to missing data, as denoted by a period (“.”).

Manipulation Check

As a manipulation check, subjects were asked to respond to both an aided and unaided recall question about the source of the message they viewed. 89% of respondents accurately identified the source of the message unaided. 93% of respondents correctly answered the aided recall question. The results of the unaided recall test were found to be significantly manipulated from random responses through a Chi-Squared Goodness of Fit Test $\chi^2(1, N = 88), p < .01$. The results of the aided recall test were found to be significantly manipulated from random responses through a One Sample Binomial Test $N=110, p<0.01$. The results met the standard for the manipulation check and could be used.

Development of Indexed Variables

For each of the dependent variables, a principal component factor analysis was run and Chronbach’s Alpha was conducted to assist in indexing the variables. Once the factor analysis was completed for each variable, an index was created, and descriptive

statistics were calculated. The index consisted of summing all of the items that loaded together in the factor analysis to create an index total of all items. Cronbach's alpha confirmed that the items not only loaded together but also were reliable when summed together.

Credibility was a dependent variable, which was the summary of 15 questions. The factor analysis revealed that two factors accounted for 74.5 percent of the total variance. All factors were consistent with the exception of "unbiased," which was dropped from the index for final analysis. A reliability analysis was conducted and the credibility index resulted in a Chronbach's Alpha of 0.977.

Persuasiveness was a dependent variable, which was the summary of three questions. The factor analysis revealed that two factors accounted for 87.6 percent of the total variance, but one of the variables, "Share by Phone" was not positively correlated with the other two variables. When "Share by Phone" was removed from the index for this variable the reliability of the persuasiveness index, as measured by Chronbach's Alpha, increased from 0.434 to 0.722.

Attitude was a control variable, which was the summary of three questions. The factor analysis revealed that one factor accounted for 92.8 percent of the total variance. All factors were consistent and remained as part of the index for final analysis. A reliability analysis was conducted and the attitude index resulted in a Chronbach's Alpha of 0.961.

Involvement was a control variable, which was the summary of three questions. The factor analysis revealed that one factor accounted for 80.3 percent of the total

variance. All factors were consistent and remained as part of the index for final analysis. A reliability analysis was conducted and the attitude index resulted in a Chronbach's Alpha of 0.877.

Detailed output from the factor analysis of each variable, as well as descriptive statistics for each variable, are presented in *Appendix D*.

Hypothesis Testing

A 2 (Source type) x 2 (Message content) MANOVA analysis was used to test hypotheses 1 and 2. All analyses were conducted with a significance level of $p < 0.05$.

The repetition variable of message content was incorporated in the study. After analyzing the results of both message content conditions, it was determined that message content did not have a significant effect on user perceptions of credibility, $F(1, 108) = 0.745, p = .39$ or on user perceptions of persuasiveness, $F(1, 108) = 1.35, p = .247$. All future analyses collapsed conditions 1 and 2 into a single condition referred to as "Organizational Source" and conditions 3 and 4 were collapsed into a single condition referred to as "Individual Source".

Hypothesis 1 predicted that organizational message sources would be more credible than individual sources. A one-way ANOVA revealed a significant relationship between source type and credibility, $F(1, 108) = 40.62, p < .001$. As expected, organizational sources were found to be significantly more credible than individual sources.

Hypothesis 2 predicted that organizational sources would be more persuasive than individual sources. A significant relationship was found between source type and

persuasiveness, $F(1, 108)=9.4, p=.003$. As expected, organizational sources were found to be significantly more persuasive than individual sources. Subjects were also more likely to share messages from organizational sources with others via social media.

Hypothesis 3 predicted that messages that were found to be more credible would also be more persuasive, independent of their source. This study found that credibility and persuasion scores were significantly correlated, $r(108) = .382, p < .001$.

Additional Testing

Several control variables were tested to determine their effect on credibility and persuasiveness. In addition, we conducted a MANOVA analysis to determine whether the hypotheses continued to be significant after controlling for potential confounding variables. The MANOVA analysis used source type as the independent variable, credibility and persuasion as the independent variables, and perceived risk, involvement with message, and attitude toward source as control variables.

The results of the MANOVA analysis showed that when we controlled for risk, involvement, attitude, the effects of organizational and individual sources were significant on credibility, $F(1, 108)=18.56, p < .001$, but not persuasiveness, $F(1, 108)=2.576, p=.112$. Specifically, the MANOVA shows that risk did not have an effect when controlled. Involvement did not have an effect on credibility and had a near-significant effect, $F(1, 108)=3.519, p=.064$, on persuasiveness. Attitude had an effect on the results for both credibility and persuasiveness.

Perception of risk was not significantly correlated to either credibility, $r(93) = .06, p = .56$, or persuasiveness, $r(93) = .03, p = .79$. As a result of this analysis we can

rule out perception of risk as a significant confounding variable in this study. This is contradictory to previous research, and will be discussed in more detail in the discussion.

User involvement was significantly correlated to both credibility, $r(108) = .377, p < .001$, and persuasiveness, $r(108) = .266, p = .005$. This confirms that user involvement in reviewing a message enhances both the credibility and persuasiveness of a public safety message. User involvement was determined to be independent of message source, $F(1, 108) = 0.153, p = .697$.

Attitude toward source was significantly correlated to both credibility, $r(108) = .774, p < .001$, and persuasiveness, $r(108) = .427, p < .001$. This confirms that attitude toward source is significantly linked to both credibility and persuasiveness of public safety message. Attitude toward source is significantly linked with source type $F(1, 108) = 20.81, p < .001$. This result is expected.

DISCUSSION

This experiment examined the effect of source type on the credibility and persuasiveness of public safety messages communicated via social media. There were two independent variables, message source, and message content. The method was a 2(source) x 2(message) factorial design. There were three primary hypotheses. First, we expected organizational sources to be more credible than individual sources. Second, we expected organizational sources to be more persuasive than individual sources. Finally, we expected message credibility and persuasiveness to be significantly correlated, regardless of source.

This study found that in social media, organizational sources communicating public safety messages, such as emergency response agencies, are more credible than those from individual sources. The study also found that organizational sources of public safety messages are more persuasive, and are more likely to be shared with others, than individual sources. These findings were found to be true for two different types of message content – both for man-made and natural disasters. The significant relationship between source type and credibility held true even after controlling for perceived risk, user involvement and attitude toward sources. In addition, we found that public safety messages that are perceived to be more credible will also be more persuasive, regardless of source.

These findings provide useful information for public safety agencies that are adapting their public notification systems and communication plans to utilize emerging

social media technology. Some practitioners believe that widespread use of social media by the public marginalizes the role of official sources, or reduces the need for structured, planned communication in times of crisis (Kelleher, 2009). However the results of this study illustrate that even with the adoption of new technology, public safety agencies and other official sources have a critical role to play in the creation and dissemination of information during timely public safety crises. Organizational sources are found to be more credible and persuasive than individual sources in social media, and so they remain central to providing timely, accurate and actionable information to the public. We will now discuss the specific findings of the study in some detail.

In the context of this study, the relationships between source type and the credibility and persuasiveness of public safety messages were found to be true for two different repetitions of message content. The study included a repetition variable that altered the content of the public safety message between a man-made and natural disaster, but this did not result in a significant difference in user response. Both variable conditions involved proximal, timely events that required immediate action by the public, and both included links to additional information. However one condition involved a chemical spill and the other involved a tornado. These findings, although limited, should give confidence to practitioners that organizational public safety messages can be effective across a broad spectrum of emergency situations.

Unlike the findings of a previous study by Berlo, Lemert & Metz (1969), perceived risk was not found to be a significant predictor of message credibility or persuasiveness. In some research safety has been seen as a key predictor of source

credibility, but this was not the case in the current study. This was an unexpected finding. There was no correlation between the relative level of concern expressed by subjects and their evaluation of source credibility. Likewise, the likelihood that a subject would share the stimulus was not affected by their perceived risk. One possible explanation for this finding is that the credibility rating questions in the survey specifically asked subjects to evaluate the credibility of the message source, rather than the credibility of the message itself.

The study found that source credibility and attitude toward source were closely linked. This is consistent with prior research from Olson & Cal (1984), who found that in offline communication, attitude and credibility are closely linked. Chiagouris, Long & Plank (2008) extended this research to online communication, finding the same link between credibility and attitude on internet websites. Recent research on social media advertising by Zafar & Kahn (2011), confirms that credibility is the most important factor influencing the favorability of advertisements in social media. It is no surprise then, to find a strong correlation in this study between subjects in this who found organizational sources credible and those who held a favorable attitude about message source.

Critics of social media report that the medium does not demand enough conscious attention from its audience to be a significant persuasive tool (Kushin & Yamamoto, 2010). However, the finding of this study suggests that users who do pay close attention to social media are more likely to respond to and act on the content they view. This study found a significant positive correlation between user involvement and the outcomes of credibility and persuasion. Subjects who reported paying greater attention and

concentration to message content in this study also reported that sources were more credible and messages were more persuasive. This is a positive finding, because it underscores the value of social media as a communication tool and not just an idle amusement. The link between user involvement (or elaboration) and credibility is well studied. Researchers have found that organizational and official sources are more credible in both high and low-elaboration situations. This is reflected in the current study as well. (Tormala, Briñol, and Petty, 2007). User involvement was determined to be independent of message source. This is expected, as users who pay more attention to a message are more likely to find it credible and persuasive.

Hypothesis 1 proposed that social media messages from organizational sources would be more credible than messages from individual sources. The link between “officialness” and credibility has been well documented throughout the history of communication literature (Pornpitakpan, 2004). This can be partially explained by the components of credibility, which are expertise and trustworthiness. Presumably organizational sources are recognized as more expert than users, and because of their official standing they are seen as more trustworthy (Farr, 2007). However the link between “officialness” and credibility in social media has not been as closely linked. In fact, some researchers have gone as far as to suggest that in social media official sources are less credible than users (Wigley & Fontenot, 2010; Westerman, Spence & Van Der Heide, 2012). This study is in contrast to those findings.

Hypothesis 2 proposed that social media messages from organizational sources would be more persuasive than messages from individual sources. This hypothesis builds

on the first, and assumes that more credible organizational messages would also be more persuasive. In our study when the relationship between source type and persuasiveness was controlled for risk, attitude and user involvement via a MANOVA, the relationship was found not to be significant. This suggests that unlike the relationship between source type and credibility, there are confounding variables that enhanced the observed relationship between source type and persuasiveness in this study. One possible explanation for this is that the study measured persuasion as the intent to share a message, which is a measurement of implied engagement, rather than a direct measure of persuasion. If a more direct measurement of persuasion were employed, a different result may have been reached.

The fact that source and persuasiveness were not linked after controls may suggest that the relationship between these variables was weakened by a confounding variable, such as user involvement. Other studies have found that in situations with high levels of time pressure, the effect of source credibility on persuasion was weakened (Higgins, 1999). Public safety news alerts tend to be very timely, and the nature of social media communication lends itself to quick evaluations and low levels of elaboration.

Hypothesis 3 proposed that messages found to be more credible would also be more persuasive. Consistent with the literature, the study found a significant correlation between credibility and persuasion, regardless of source. This suggests that a subject's subjective opinion of credibility can be a predictor of the likelihood that they will share a message.

The link between credibility and persuasion has been well documented over time, beginning with Hovland & Weiss (1953), who found that credible public speakers were more persuasive than their less credible counterparts. The research was further validated by Heesaker & Petty (1983). The link between credibility and persuasion was seen to be the most pronounced when messages were highly relevant and personal in nature (Petty & Caci, 1981). Public safety alerts are certainly highly relevant to the target populations who must take action as a result of them.

Practical Implications

The findings of this study provide useful information for practitioners managing public communication programs for organizations, nonprofits and corporations, especially those who are incorporating social media as a communication channel in their strategic communication programs.

Popular communication and public relations literature abounds with articles explaining the “rules of social media public relations” and even discouraging public relations practitioners from engaging in social media at all (Julien, 2012). However, most popular literature is based on opinion rather than research. Few of the commentators, authors and consultants providing social media advice are pointing to specific findings in the academic literature that examine the way actual social media users respond to stimulus. (McCaffrey, 2012)

This study finds that despite claims by some industry commentators, there is a role for organizational communicators to play in social media. In fact, under the right

circumstances, organizational sources can be more credible and more persuasive than organic, user-generated content about an issue.

The role of organizational communication is especially important in times of crisis. While it is true that social media allows individuals to become involved in a public dialog about crisis events, in the form of “distributed public relations,” there must be some factual basis for the dialog. (Kelleher, 2009). Organizational communicators can fill the role of providing credible, trustworthy information that forms the basis for the online conversation. In the absence of this information a vacuum of credible official information is created. The conversation will still take place, but the basis for the conversation may be less accurate and less helpful to the audience.

A social media strategy should be incorporated into the public outreach and communication plans of all public safety agencies. Many public safety organizations, such as the U.S. Federal Emergency Management Agency and the U.S. Centers for Disease Control, are already active in social media. This study validates the importance of this work.

An additional finding in the study may be of use to communication practitioners. The results of this study upheld the long understood link between attitude and credibility. As cited previously in this discussion, one of the strongest predictors of source credibility is attitude favorability toward a source (Zafar & Kahn, 2011). This finding reinforces the importance of a public safety organization building a strong positive relationship with community members in advance of a crisis, to enhance the credibility of the organization as a source of trustworthy information. Although this has been understood by

professional communicators for a long time, it bears mentioning in the context of this study's findings.

The findings of this study may be useful if extended beyond public safety communication into other facets of organizational communication – such as public relations, advertising and marketing. While popular commentators are bemoaning the death of the communication profession, this study suggests that the role of organizational communication in social media deserves another look (Sutton, 2012). One useful extension of this research would be to examine the credibility and persuasiveness of other types of organizational communication, such as news releases, media reports and advertisements.

Limitations and Future Directions for Research

There are some limitations of the current study which are noted here. The first is related to sample size. This study is intended as a pilot study and is not intended to be generalized to the broader US population. Of course, experiments by and large do not try to generalize to the larger population. The sample size of 110 is adequate to provide statistical power of > 0.80 .

To maximize the manipulation of the dependent variables and enhance the external validity of the study, the sample population was drawn from a very specific geographic area (The Woodlands, Texas) and used stimulus that was geographically specific. This was effective in enhancing the reality of the experiment for participants, but it does raise the question as to whether the results would be the same in other parts of the country, with different populations or demographic groups. To ensure internal

validity, the study incorporated a number of controls both through the design of the study, and through the use of various control variables such as attitude, perceived risk and user involvement. One strength of the sample is that it was a true cross-section of a community, and not a homogeneous population of undergraduate students as other studies of this subject matter have been (Chiagouris, Long & Plank, 2008).

One issue central to the study of social media is the identification of sources (Metzger & Flanigan, 2009). While sources are represented by online accounts or avatars, it is not always possible for users to be certain of the identity of the person or groups responsible for managing online accounts. Users are forced to use message features and visual cues to make judgments about their authenticity and credibility (Lee, Park, Lee & Cameron, 2010). This can make gauging source credibility difficult within online media.

The stimulus in this study focused on a timely, urgent natural disaster. While this was helpful in creating a strong manipulation effect for subjects, it doesn't speak to long-term, chronic risk scenarios such as personal health and safety choices, which may be of interest to researchers in the field of public safety. Future studies can overcome this limitation by providing a broader range of topics and risk/chronic risk scenarios as part of the stimulus design.

Finally, this study did not observe actual behavior in a laboratory setting, but instead used simulated messages and asked subjects to rate their behavioral intent, asking them what they "would do". In this environment it is difficult to understand each subjects' motivations and their complex emotional response to risk. Within a population, individuals are likely to react to situations differently due to their own behaviors and

beliefs. News diffusion research shows that some people are more naturally predisposed to share news, while others are unlikely to do so (Rodgers & Seidel, 2002). Observing behavior in a laboratory setting would be another way to test and confirm the results of the study. One strength of the study was that subjects completed the study within their own social network, on their own personal computer hardware, rather than participating in a paper and pencil survey. This survey treatment method closely simulated the conditions in which they would actually experience social media crisis messages. Future studies can take a closer look at this in a laboratory setting.

CONCLUSION

The increasing popularity of social media for interpersonal communication has created challenges and opportunities for those responsible for communicating public safety information. The traditional one-way model for official communication is being replaced by a two-way symmetrical and network communication model. In order for communicators to respond to the changing communication environment and improve existing systems, research needs to be conducted to help understand the factors that affect the credibility and persuasiveness of public safety messages within this new media environment.

This study looked at one community's response to simulated public safety messages from both organizational and individual sources, and tested the relationship between source type, credibility and persuasiveness. In this case, organizational sources were found to be more credible than individual sources, and more persuasive as well. Community attitude toward message source was also found to be an important component of the credibility and persuasiveness equation.

By helping to understand the relationship between source, credibility and persuasion in the context of the social media environment, this research project can make an important contribution to the field of public safety communication, and provide additional insights to the growing body of academic work that seeks to understand and explain the dynamics of social media.

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FIGURES

Figure 1:
Results of power analysis

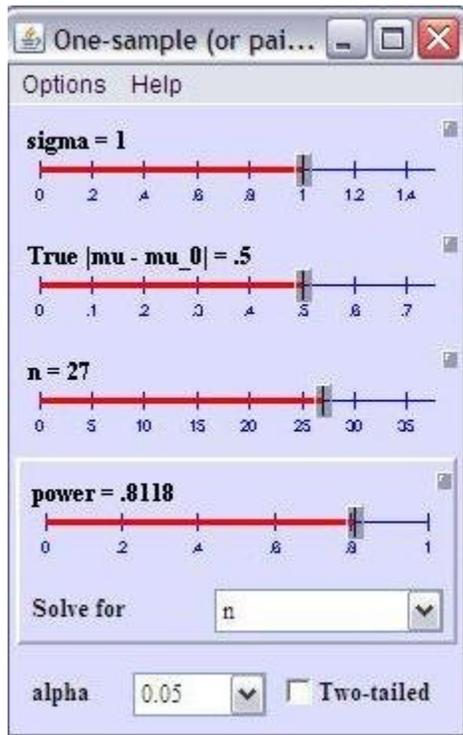


Figure 2:
Boxplot of Credibility by Source (P<.001)

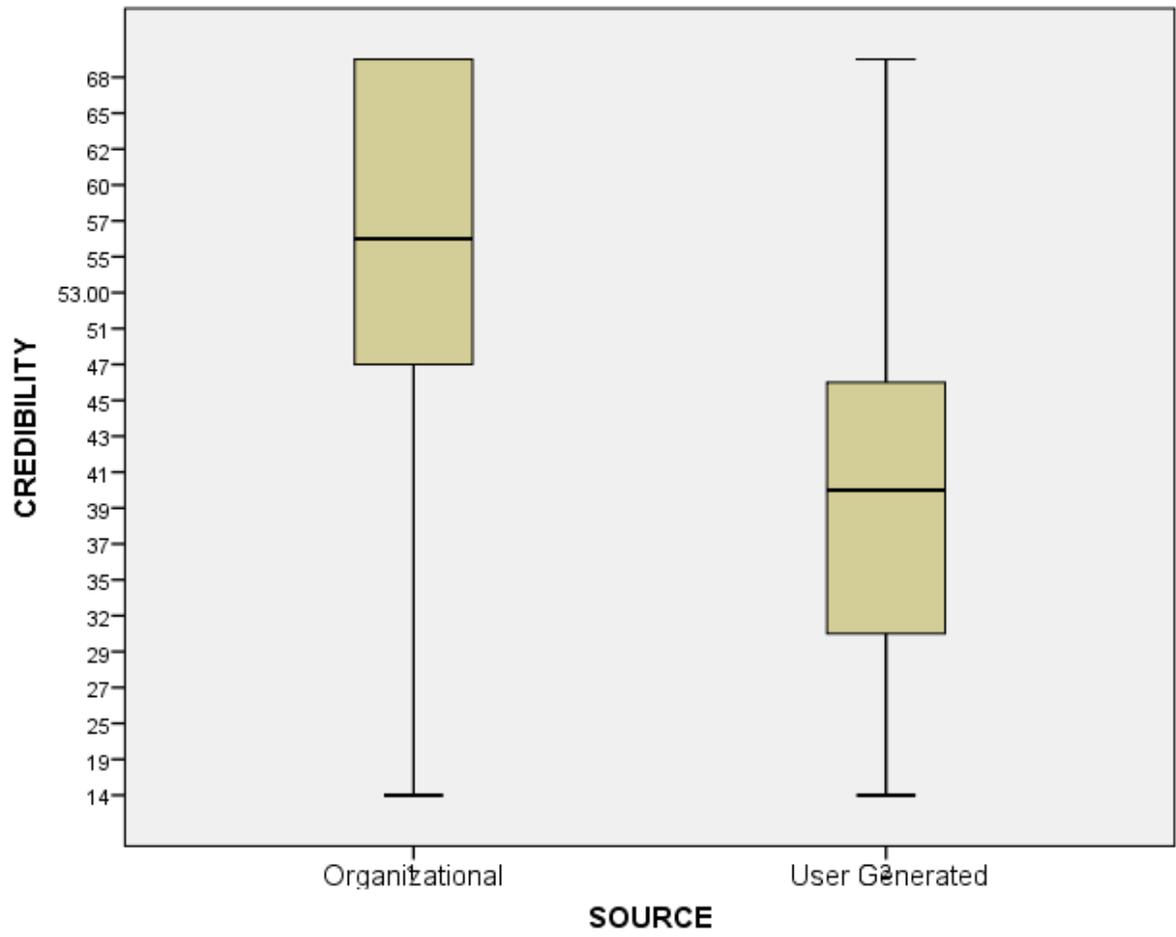
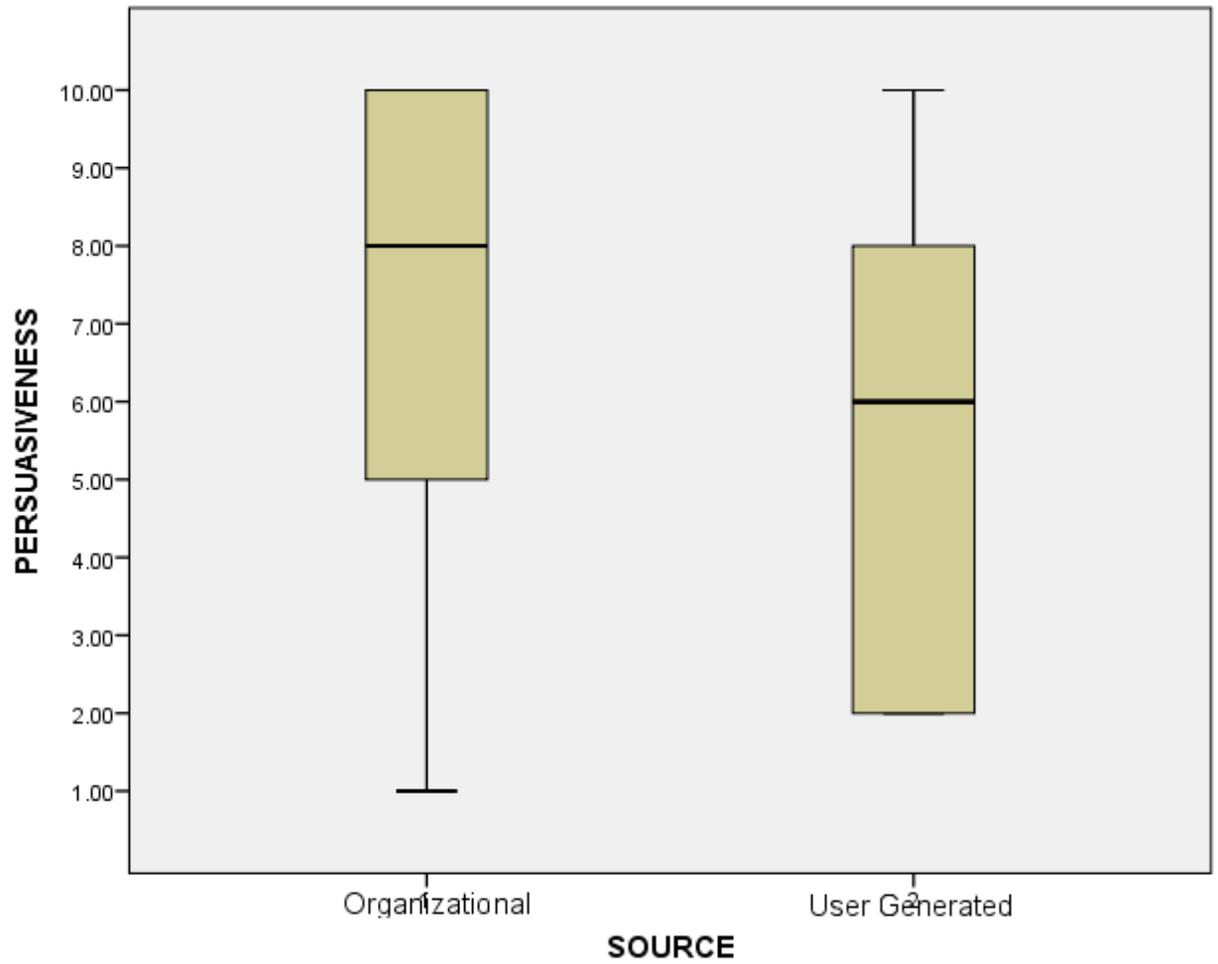


Figure 3
Boxplot of Persuasiveness by Source ($P < .001$)



APPENDIX

Appendix A

Sample Stimulus Material

Condition 1 – Organizational Source – Man-Made Disaster



Condition 2 – Organizational Source – Natural Disaster



Condition 3 – Individual Source – Man Made Disaster

The screenshot shows the Twitter profile of Jen in the Woods (@jenswoods). The profile header includes a profile picture of a woman and two children, the name "Jen in the Woods", the handle "@jenswoods", and a bio: "Woodlands mom of two and substitute science teacher. Tweeting about Woodlands news, Aggie sports, environmental education and family life." The location is "The Woodlands, Texas" and the website is "http://www.Jeninthewoods.com". Statistics show 257 Tweets, 29 Following, and 1235 Followers. A navigation menu on the left lists Tweets, Following, Followers, Favorites, and Lists. The main tweet, posted "About 5 minutes ago", reads: "Lake Woodlands Dr. closed due to hazardous chemical spill. Woodlands residents -- shelter in place to avoid toxic fumes! http://bit.ly/fmJ2qj".

Condition 4 – Individual Source – Natural Disaster

The screenshot shows the Twitter profile of Jen in the Woods (@jenswoods), identical to the one above. The main tweet, posted "About 5 minutes ago", reads: "Tornado reportedly touched down near Lake Woodlands Dr. Woodlands residents advised to take shelter immediately! http://bit.ly/fmJ2qj".

Appendix B

Survey Instrument

Introduction:

This study examines the effectiveness of public safety communication via social media, and will take approximately 5 minutes to complete. Please review the consent form below and click on the link below to begin.

In order to be eligible to participate in this study:

- You must be 18 years of age
- You must be a resident of The Woodlands, Texas

Imagine that the message below appeared as part of the news feed on your social network. Review the message closely click on the link below to complete the survey.

Survey:

Who wrote the public safety message you viewed? (Open ended)

The Twitter account that posted message you viewed was:

- A public safety agency
- An individual
- A news media outlet
- A for-profit corporation

The message you viewed was only a sample. However, if it had been a real public safety alert, which of the following choices describes the way you would feel about the safety of you and those close to you?

- Very unsafe
- A little unsafe
- Safe
- Very safe
- Don't know / can't say

Please describe your experience in viewing the public safety message you reviewed
1 = Strongly disagree / 2 = Disagree / 3 = Neutral / 4 = Agree / 5 = Strongly agree

- I paid attention to the content of the message
- I carefully read the content of the message
- When I saw the message, I concentrated on its contents

Please describe your attitude toward the source of the message you viewed.

1 = Strongly disagree / 2 = Disagree / 3 = Neutral / 4 = Agree / 5 = Strongly agree

- I feel GOOD about the source
- I feel POSITIVE about the source
- I feel FAVORABLE about the source

To what degree did the source of the message you viewed represent each of the following qualities?

1 = Not at all // 5 = Completely

- EXPERTISE
- EXPERIENCED
- KNOWLEDGABLE
- QUALIFIED
- SKILLED
- DEPENDABLE
- HONEST
- RELIABLE
- SINCERE
- TRUSTWORTHY
- CREDIBLE
- BIASED
- BELIEVABLE
- REPUTABLE
- TRUTHFUL

In the event of an actual chemical spill, what is the likelihood that you would "retweet" the message within Twitter?

- 1
- 2
- 3
- 4
- 5

Very unlikely

Very likely

In the event of an actual chemical spill, what is the likelihood that you would share this message on the internet via another social network or via email?

- 1
- 2
- 3
- 4
- 5

Very unlikely

Very likely

In the event of an actual chemical spill, what is the likelihood that you would share this message via telephone?

1

2

3

4

5

Very unlikely

Very likely

In the event of an actual chemical spill, what is the likelihood that you would share this message in a face to face conversation with another person?

1

2

3

4

5

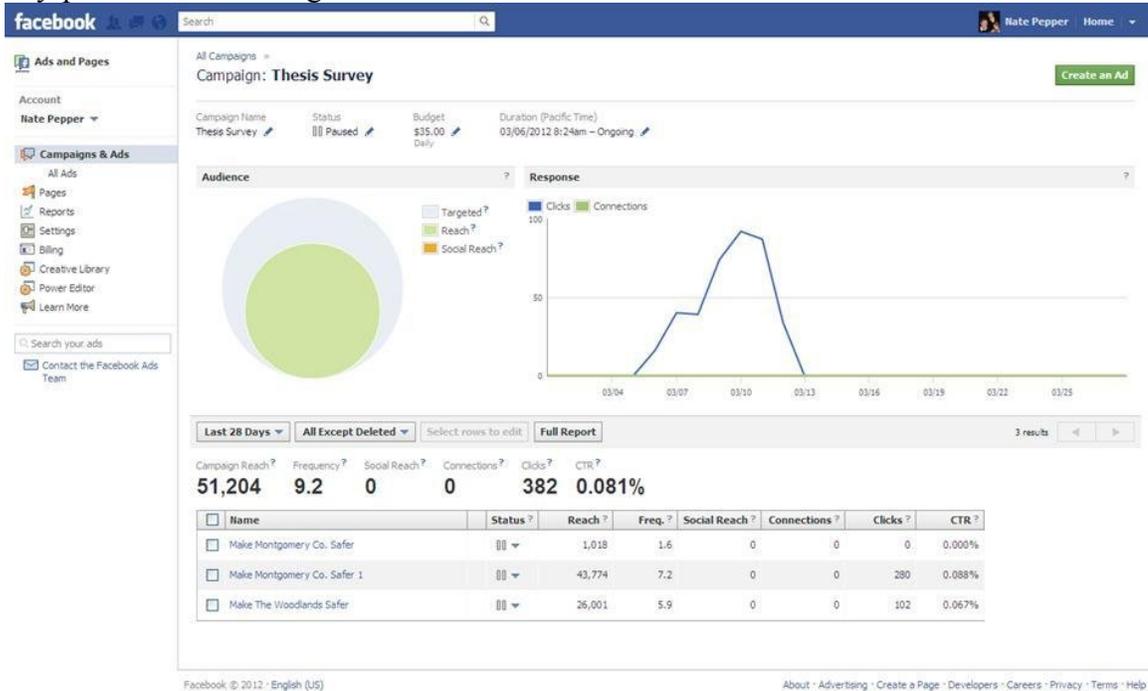
Very unlikely

Very likely

Appendix C

Participant Recruitment Statistics

Pay-per click advertising statistics from Facebook



Appendix D

Descriptive statistics

Table 3: Descriptive statistics for all variables

Variable	M	SD	n	Min	Max
Credibility	46.82	16.26	110	14	70
Persuasion	6.39	8.63	110	3	21
Risk	3.40	1.24	93	1	5
Attitude	10.21	3.75	110	2	15
Involvement	11.49	3.40	110	3	15

Appendix E

Results

Table 4: Significance Tests – Impact of Source on Dependent Variables

Dependent Variables		Organization	Individual	F
Credibility	M	55.29	38.36	40.62**
	SD	(15.04)	(12.72)	
Persuasiveness	M	7.21	5.56	9.40**
	SD	(2.71)	(2.94)	

Note. * $p < .05$. ** $p < .01$. For Organizational and Individual Sources, $N=55$

Table 5: Significance Tests – Results of MANOVA with Control Variables

Source	Dependent Variable	df	Mean Square	F	Sig
Source	Credibility	1	1604.187	18.564	.000**
	Persuasiveness	1	17.544	2.576	.112
Risk	Credibility	1	27.939	0.323	.571
	Persuasiveness	1	0.032	0.005	.946
Involvement	Credibility	1	72.841	0.843	.361
	Persuasiveness	1	23.977	3.519	.064
Attitude	Credibility	1	6213.115	71.901	.000**
	Persuasiveness	1	47.999	7.044	.009*

Note: * = $p < .05$, ** = $p < .01$

Table 6: Relationship Between Control and Independent Variables

Dependent Variables		Credibility	Persuasiveness
Risk	N	93	93
	Pearson Coefficient	0.06	0.03
User Involvement	N	108	108
	Pearson Coefficient	0.38**	0.27*
Attitude	N	108	108
	Pearson Coefficient	0.77**	0.43**

Note: * = $p < .05$. ** = $p < .01$

VITA

Nathan Pepper is a public relations professional with 15 years of experience working for global corporations including DuPont, International Paper and Granada Television (U.K.) He is a candidate for a masters degree in strategic communication from the Missouri School of Journalism at the University of Missouri – Columbia. He also holds a master’s of business administration degree from Louisiana Tech University and a bachelor’s degree in mass communication from the S.I. Newhouse School of Public Communication at Syracuse University.

Nathan is a member of the Public Relations Society of America, Houston Chapter, and the Communications Leadership Group of the International Association of Chemical Councils. He lives in Texas with his wife, Christy and his daughters, Kaitlyn and Addison.