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Social media and crisis research: Data collection and directions

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ABSTRACT

Social media platforms may be advantageous to those conducting research on communicative responses to crises and disasters, as they allow for the examination of public responses as cataclysmic events unfold. These technologies are also useful for reaching those affected by disasters in a manner not feasible with traditional methods of empirical inquiry. The current essay discusses recent advances in the use of social media for recruiting participants, collecting data, and evaluating audience needs and expectations. This literature is discussed in the context of its implications for scholars, social media managers, and emergency practitioners.

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1. Introduction

Crisis and hazard research poses significant procedural obstacles to applied communication scholars. By definition crises are unexpected, non-routine events that often create conditions that are not favorable toward traditional methods of data collection (Seeger, Sellnow, & Ulmer, 2003, Nelson, Spence, & Lachlan, 2009). The nature of these events are exceptionally novel, and their unpredictability often makes data collection difficult at best (Spence & Lachlan, 2010). However, the proliferation of social media has created new venues for examining how individuals and organizations communicate during the crisis lifecycle. Although promising, methods and measures for data collection through social media in crisis situations are unstructured, untested, and there is little agreement on the best means to achieve research goals (Nelson et al., 2009). This essay outlines some practices for data collection, sampling, and analysis of crisis communication data through social media. Advantages and disadvantages to varying approaches are discussed. Although the procedures discussed in this article are not exhaustive, it is hoped that the current essay will initiate ongoing conversations regarding the utility and best practices of using social media to collect data on crises and risks.

As noted by Spence and Lachlan (2010), often access to the physical site of a disaster is restricted. This can be because of dangers associated with the site, clean up, ongoing recovery, or that disaster research is viewed as a secondary issue to more immediate

concerns. Thus hazard and crisis research often is conducted long after the trigger event, when conditions have normalized. Because of this, threats such as bias and retrieval error may be concerns (see Tourangeau, Rips, & Rasinski, 2002), and it also limits the methods researchers can utilize in addressing specific questions (Spence & Lachlan, 2010). These and other limitations often open crisis and disaster researchers to criticism. Although using social media to collect data may open up additional criticisms, such as issues of inclusion and exclusion and information fabrication, it also presents opportunities for overcoming these long standing limitations associated with the validity and generalizability of crisis and risk data. The current essay examines issues of data collection, sampling and research design revolving around scholarly and applied research using social media in the examination of crisis communication.

2. Data collection

One of the first obstacles that many disaster and crisis researchers encounter is the inability to generate randomized samples and the subsequent concerns this presents when evaluating the representativeness of the sample. Many crisis and disaster scholars indicate that this is the most common criticism when their research is reviewed. The advantages of the randomization of participants are well documented in the research and statistics literature. Sawilowsky (2007) offers an especially robust defense of the use of randomized sampling. In a series of experiments designed to examine differences in errors, three studies were completed using Monte Carlo simulations with the goal of demonstrating what

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happens in commonly used quasi-experimental designs. Results demonstrated several potential errors that manifest when using non-randomized designs, most notably increases in Type 1 errors. Although it is difficult (and possibly foolish) to argue with the support Sawilowsky (2007) offers for the superiority of randomized designs, his claim that there is no place in science for non-randomized designs may be overstated. As noted by Campbell and Stanley (1963), non-randomized designs are useful in situations where better designs are not feasible (also see Shadish, Cook, & Campbell, 2002). Further, there are often circumstances where it is not logistically possible to conduct a randomized study (Anderson et al., 1980), and it is easy to see how this may be the case in the aftermath of many crises and disasters.

In a series of published studies following Hurricane Katrina, Hurricane Ike, and similar other crises (see Burke, Spence, & Lachlan, 2009; Burke, Spence, & Lachlan, 2010a, 2010b; Burke & Zhou, 2009; Lachlan, Burke, Spence, & Griffin, 2009; Lachlan & Spence, 2007; 2010; Spence, Lachlan, & Burke, 2007a, 2011; Spence, Lachlan, Griffen, 2007; Spence, Nelson, Lachlan, 2010) researchers used non-randomized designs to address questions concerning information seeking patterns following crises, satisfaction with information received, and knowledge gaps across diverse populations. In the cases of Hurricane Katrina and Ike, evacuations were mandatory or strongly encouraged for areas of Louisiana and Texas. Displaced residents initially stayed in campgrounds, hotels, mass care centers, or with strangers. Others found themselves in need of safe housing and were therefore relocated to different parts of the country. As noted by Spence and Lachlan (2010) “in the immediate days following the evacuation the acquisition of an accurate sampling frame was unrealistic; moreover such lists did not exist” (p.98). These studies used self-administered surveys which were given to displaced individuals. Through acknowledging the limitation, specific arguments were made for the value and generalizability of the data. Spence and Lachlan note that “[p]roviding a clear statement of assumptions and limitations allows the reader (especially non-academic audience) to assess the value, merit, significance, and potential utility of findings and conclusions in a non-academic setting” (p. 99). Although the argument for the superiority of randomized designs offered by Sawilowsky (2007) is sound, and possibly the strongest argument offered in social scientific literature, disaster and crisis researchers exist in circumstances where adherence to randomization in research designs is often not possible. Because this criticism is so common to disaster and crisis researchers, it will be addressed throughout this essay.

3. Participant selection, recruitment and research design

Numerous scholars have also argued that it might not be desirable to randomize respondents when collecting data after a disaster. Under such circumstances, researchers should carefully define their target population of interest, and analyze the collected data accordingly (Groves et al., 2004; Spence & Lachlan, 2010). Comparisons between the obtained non-randomized sample and known population parameters may be useful in establishing some degree of confidence in the generalizability of the obtained data. Moreover, physically coming in contact with participants to survey may be difficult due to recovery and response efforts. Social media can provide researchers an opportunity to contact individuals affected by the crisis, without having to come in direct contact, also allowing the researcher to stay out of the way of recovery efforts.

For example, Twitter or Facebook, and other forms of social media could be used to recruit participants to fill out a survey at any point during the crisis lifecycle. However, research on using these methods in addition to advertisements is mixed (Bull, Levine, Black,

Schmiege, & Santelli, 2012; Fenner et al., 2012; Ramo & Prochaska, 2012; Ramo, Hall, & Prochaska, 2010), and more research is required. A researcher could post a link asking people who are affected by the crisis to participate. The key advantage to this technique of data collection is speed. Data related to crises, emergencies, and disasters is often collected days or weeks after a non-routine event, forcing the participant to answer questions about prior circumstances, introducing the issue of bias, or numerous other forms of retrieval error (see Tourangeau et al., 2002). Thus, prioritizing promptness of collection over perfect representativeness has several advantages.

The use of social media to collect data at multiple points during the crisis lifecycle may also allow researchers to evaluate the effectiveness of information campaigns in a longitudinal manner. Allowing the researcher to ask questions before the trigger event, during the crisis (if appropriate), and at any point or multiple points after the crisis, may be advantageous in terms of data collection. Although not ideal for all crises, a respondent could be asked questions about emotions, actions, perceptions, and communication at several points throughout the crisis lifecycle, and social media solicitation may be helpful in obtaining data at multiple time points from individuals who may be difficult to reach using conventional means of survey administration.

Although the use of social media may be advantageous in reaching individuals that otherwise would not be able to participate, this does raise the issue of several types of bias such as undercoverage and ineligible units. When elements of the target population are missing from the frame, this is labeled undercoverage and can be a result of the absence of a population list from which participants may be drawn. This issue can be addressed in the limitations section of an article and is a concern, but one that could be argued as relatively minor compared to the value of the collected data.

The presence of ineligible units is a more difficult issue. These are elements that are not part of the target population but either were included in the frame, or have somehow been inadvertently exposed to some kind of intervention or received instrumentation. Because they are not part of the target population, their responses introduce error into the study, and caution must therefore be taken to clearly articulate to participants the requirements for inclusion. A disaster researcher using a survey methodology should be ready to address these threats, control for them to the extent possible during data collection, and acknowledge them in the reporting of the data (for further discussion on survey error see Groves et al., 2004). Ineligible units could appear in crisis and disaster studies where recruitment is conducted through social media in several ways. For example, if the crisis is limited to a specific geographic location, people outside the geographic location may gain access to the recruitment procedure and follow the provided link. Ways to control for this include filtering questions to eliminate ineligible units. Moreover, some survey software allow for the collection of IP addresses and geolocation measures, thus helping the researcher to remove responses from ineligible participants.

Social media recruiting techniques, while not entirely robust to the inclusion of ineligible units, are useful in their capacity for generating snowball samples. Because a list of eligible units is likely not available during a crisis, the snowball sample or respondent-driven sampling (Heckathorn, 1997), can allow eligible participants to recruit other eligible participants. Snowball sampling involves a chain referral sampling method, thus eligible units provide referrals to help the researcher locate additional subjects. Sadler, Lee, Lim, and Fullerton (2010) outline several of the advantages and disadvantages with snowball samples. They note how health-care researchers often work with populations that are difficult to identify and contact. This creates similar problems to those

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