Crisis preparation, media use, and information seeking during Hurricane Ike: Lessons learned for emergency communication

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ABSTRACT

This study was a replication and extension of a previous work that examined crisis preparation, information-seeking patterns, and media use in the aftermath of Hurricane Katrina. A quantitative survey study was undertaken to examine the same variables after Hurricane Ike. Surveys were collected from 691 Hurricane Ike evacuees. Respondents were more likely to have an evacuation plan or emergency kit than those displaced by Katrina, and older respondents were less likely than younger respondents to have an emergency kit in place. Women, African Americans, and older respondents indicated a greater desire for information, with African American respondents desiring information concerning government responses, evacuation efforts, and rescue operations. Television and interpersonal exchanges emerged as the most commonly used sources for information. The findings are discussed in terms of pragmatic implications for emergency management practitioners regarding message design and placement.

Key words: crisis communication, information seeking, race, gender

In September 2008, Hurricane Ike made landfall as a category 4 storm that affected several countries including Cuba, Haiti, and the United States. The hurricane was responsible for 114 deaths and more than $10 billion dollars in damages. Coastal communities in Texas, such as Galveston, experienced the brunt of the damage. Hurricane Ike made landfall in the United States on September 13th as a category 2 storm with winds reaching 110 mph. It was the third costliest hurricane in the US history. Hurricane Ike was a storm of great interest not only because of its size but also because of the devastation associated with Hurricane Katrina two years earlier. Hurricane Katrina created a memorable media spectacle as residents who could not or did not evacuate New Orleans waited on rooftops, in public centers, and in attics for relief amid toxic floodwaters, uncertain conditions, and shortages of food, drinking water, and medical services.¹ ²

The management of information is a critical consideration in emergency response efforts. An understanding of media usage patterns and responses of multiple audiences is essential in providing information concerning precautions, safety, evacuation efforts, and other potentially lifesaving information. Despite a wealth of data from both academic and applied research indicating differences across multiple audiences in their media preferences and responses to information under the duress of a crisis,³ messages from emergency planners and responders still tend to be targeted to an all-inclusive audience, remaining largely undifferentiated in terms of content and placement (eg, ready.gov). In effect, research has demonstrated that failure to consider differences in audience preferences may actually privilege some audience members and leave others at greater risk.

Research in both crisis communication and emergency management has suggested that emergency messages must first work to alert multiple audiences and inform them of the severity of the impending event. These messages must also address the unique needs of specific groups of individuals in terms of tangible steps and actions they can take in order to best prepare for the event; this information is critical not
only in guiding people toward ideal responses but also in minimizing the likelihood of antisocial responses such as social unrest or apathy.4

Typically, after an individual has obtained this information, he or she will continue to scan for repetition of that message, clarification, and updates.5 Thus, as a crisis develops, emergency managers must continually evaluate the content and placement of emergency messages to mitigate or facilitate these responses. Continual monitoring of the media is usually recommended by emergency managers under these circumstances; for instance, FEMA encourages the inclusion of battery-operated radios in emergency kits. Following the September 11 terrorist attacks, it was found that individuals watched an average of 8 hours of television a day for these types of updates and that television was reported as the most useful information source for this type of coverage of such events.5

This media reliance may be explained in two ways. First, repeated exposure and updates may serve to reduce the high levels of uncertainty associated with events that may threaten life, health, or property. Second, it may function as a means of creating self-efficacy by providing tangible steps that can be taken to restore a sense of normality to an otherwise uncertain audience. Therefore, it is important for emergency management officials to create messages that adequately alert and inform members of an affected audience and that continually relate and update this information by carefully considering the varying informational needs and usage patterns of those affected. Through an understanding of differences across demographics and other social categorizations in preparedness, media use, and media response, emergency planners may be better able to provide appropriate information for the varying subgroups affected by an impending or occurring emergency.

However, although our knowledge base is expanding, too little effort is given to the creation of effective-mediated emergency messages for varying targets. Crisis messages tend to be designed for general audiences and are rather undifferentiated in content and placement, giving little consideration to narrowcasting for varying target audiences. Further, they are often components of larger communication campaigns that use several outlets—mediated or otherwise—to distribute information. These campaigns may also be funded by nonprofit organizations, federal grants, or community action groups that are for all intents and purposes stakeholders in outcomes of these communication efforts. Although these campaigns typically aim to encourage ideal behaviors under the circumstances among general audiences, little consideration is given to differences within and across subpopulations in terms of perceptions and reaction to the information. Specific differences in audience responses related with demographics are given even less attention, despite some initial evidence that these differences may be very real and very relevant to emergency management efforts. Therefore, it is the goal of the current study to add to this knowledge base concerning differences in preparation, information seeking, and response across multiple audiences. By replicating an earlier study conducted in the wake of Katrina, the current study aims to find out whether there is additional evidence for considering specific underprivileged subpopulations, and the specific informational needs and behaviors of these audiences that may have implications for the design and placement of emergency messages. Both Hurricane Ike and Katrina have been labeled as a crisis. A crisis is “a specific, unexpected, and nonroutine event or series of events that create high levels of uncertainty and threaten or are perceived to threaten high priority goals including security of life and property or the general individual or community well being.”6(p233)

A crisis can produce conditions such as uncertainty, stress, and fear regarding the future, intense media scrutiny, and emotional instability, but they are also worthy of study from the emergency and disaster community. Programmatic research examining the same variables across multiple disasters may aid in the development and placement of messages to reduce the harm, severity, and duration of crises, while assisting in the development of more robust evacuation and disaster management procedures.

CRISIS PREPAREDNESS

As noted in the literature, the public will often base risk assessment on sensory perception.7 The
risks associated with natural disasters are typically visible and well understood by those living in a disaster-prone geographical area. Therefore, if the public has received appropriate information in a timely manner, it is reasonable to expect that it will take action to protect itself. However, some communities that have repeatedly experienced certain types of disasters develop a “disaster subculture,” in which knowledge is exchanged, plans are developed, and exercises are performed in effort to ensure survival.\textsuperscript{7,8} Further, in these communities, the reaction to disasters appears to be faster, more effective, and better informed.

It has been argued that this may have been less true in the case of New Orleans.\textsuperscript{3} When a warning is repeated many times it may become ineffective. Taylor and Hall\textsuperscript{9} suggested that people grow accustomed to the existence of environmental hazards and over time become less concerned about the threat; some have argued that this led to the failure to prepare for and evacuate New Orleans. Peter Sandman describes this as the outrage factor of familiarity, where a risk that is more familiar to a public is judged as less severe (peter-sandman.com). However, with Hurricane Ike being close in proximity to Hurricane Katrina (both geographically and chronologically), the memory of Katrina may have aided in promoting evacuation. Furthermore, before drawing comparisons between the two events in terms of demographic differences in needs and response, it seems critical to establish the extent to which the samples on the whole were similar in their crisis preparation efforts. In examining the perceived seriousness of the hazards posed by Hurricane Ike, the following research question is offered:

- **RQ1:** To what extent did residents of the Houston metropolitan area take preparations to survive Hurricane Ike?

**UNCERTAINTY AND INFORMATION SEEKING**

Uncertainty is a common feature of crises and extreme events, and thus the public is likely to engage in information seeking to reduce uncertainty and dissonance.\textsuperscript{10-13} Because uncertainty is an uncomfortable state, individuals can be expected to seek information in order to reduce it.\textsuperscript{14} The mass media is commonly viewed as the dominant information source\textsuperscript{11,15} as they are generally thought to have more reliable and timely information.\textsuperscript{16} The public’s need for information following the onset of a crisis necessitates that messages be specific, ordered, and distributed through media that are accessible to those in need.\textsuperscript{17} Further, as an uncertainty reduction mechanism, information also facilitates more specific remedial responses.\textsuperscript{10}

Awareness of a potential threat and associated preparations may also vary across demographics.\textsuperscript{18} For example, minorities may be at a disadvantage in terms of crisis preparedness because they are more likely to have lower incomes, nonexpendable finances, and to be unemployed.\textsuperscript{2,3,19,20} Members of these groups are also less likely to have insurance to aid in recovery.\textsuperscript{5,21} The variability in crisis preparedness across ethnicity and socioeconomic status demonstrated in previous research led to the following research questions:

- **RQ2:** What demographic differences existed in the crisis preparation of metropolitan Houston residents?

- **RQ3:** What demographic differences existed in information seeking of metropolitan Houston residents?

**PRIMARY INFORMATION SOURCES**

Research after Hurricane Katrina found both interpersonal networks and television to be critical information sources.\textsuperscript{2,3} This bolstered the research results after 9/11 that outlined the importance of interpersonal networks in information diffusion.\textsuperscript{22} A long history of research has also demonstrated support for television and interpersonal networks as sources most commonly used to acquire information concerning important news events.\textsuperscript{23-25} Given the past research concerning the importance of various information sources, the following hypothesis is offered:

- **H1:** Metropolitan Houston residents identified television and interpersonal
channels as the primary media used to learn about evacuation notices.

NEW MEDIA AS A RESOURCE

Little is known about the use of new media in seeking information surrounding crises and emergencies. Previous research after Hurricane Katrina found that new media was not used as a source to acquire hurricane-related information. This may have been due to the nature of the natural disaster, the high poverty rates in New Orleans, or the lack of appropriate diffusion of new media. Recent research has found an emergence in both the ability of new media to provide crisis-related information and the reported use of new media surrounding crisis events. Although there is some evidence that new media may be effective in crisis situations, little is known about the relative use of new media technologies under these circumstances:

RQ4. How important were new media and cellular telephones relative to interpersonal and traditional media channels before and after Hurricane Ike?

METHOD

A nonrandom sample of 691 respondents was collected from gas stations lines, relief centers, and hotels in the greater Houston area. University Human Subjects Review Board approval was obtained during the period of time before the storm made landfall in the United States. Participants were asked if they were willing to fill out a self-administered questionnaire. No incentives were provided for participation. Participation was voluntary, and a coversheet outlining the rights of the participants was provided with the survey questionnaire. Data collection was completed by one of the authors within 5 days after the Hurricane made landfall. This short data collection period was designed to reduce the potential memory problems that arise when asking respondents to answer questions about prior events, which can introduce issues of bias, or any number of types of retrieval error. In light of these limitations, descriptive comparisons were drawn between the composition of the sample and census data on the state of Texas. The current sample slightly over-represents minority respondents. The median age is 30, which is fairly close to the Texas median age of 33.1, and the sample income is similar that of Texas on the whole, though slightly skewed toward the low end (Table 1).

### Table 1. Sample demographics

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
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</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>293</td>
<td>42.6</td>
<td>42.6</td>
</tr>
<tr>
<td>Female</td>
<td>394</td>
<td>57.4</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>691</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>233</td>
<td>34.1</td>
<td>34.1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>256</td>
<td>37.0</td>
<td>71.1</td>
</tr>
<tr>
<td>Other</td>
<td>195</td>
<td>29.9</td>
<td>100.00</td>
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<tr>
<td>Missing</td>
<td>7</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>691</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>&lt;$30,000</td>
<td>109</td>
<td>18.5</td>
<td>18.5</td>
</tr>
<tr>
<td>$30,000-50,000</td>
<td>97</td>
<td>16.5</td>
<td>35.0</td>
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<td>$50,000-70,000</td>
<td>69</td>
<td>11.7</td>
<td>46.7</td>
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<td>$70,000-90,000</td>
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<td>9.3</td>
<td>56.0</td>
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<tr>
<td>$100,000+</td>
<td>64</td>
<td>10.9</td>
<td>66.9</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>195</td>
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<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>691</td>
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Embedded within a larger survey were items designed to address the research questions and hypothesis of the current study. These included three “yes” or “no” questions in which respondents were asked whether or not they were evacuated from their homes, whether or not they had any kind of evacuation plan in place as preparation for a flood or similar event, and whether or not they had any kind of emergency kit or supplies assembled in the event of such an emergency.

Ten Likert-type items addressed patterns of information seeking. Respondents were asked to indicate what information was most important to them from the following categories: scope of the damage, government responses, food and water distribution, evacuation, shelters, rescue operations, the larger impact of the storm, who was affected, friends and family, and where to get healthcare or medication (Table 2). An index score was calculated by taking the means score across all 10 items, thus producing a general information-seeking measure ($\alpha = 0.95$).

To tap the questions and hypothesis dealing with media dependence, a series of items asked respondents to list their primary sources for information from across a variety of information sources. In addition to these items, a series of demographic identifiers asked respondents to report their age, sex, and ethnicity. The items used were taken from the previous study and are established measures that have been used in several other studies examining characteristics of crisis. All data analyses were performed using SPSS 17.0.

RESULTS

Preparations for the storm

The first research question attempted to examine whether or not respondents on the whole were prepared for the storm. Of the 691 respondents, only 52 (7.5 percent) were forced to evacuate their homes. The findings for crisis preparation revealed a pattern somewhat more encouraging than what was found following Katrina, as respondents seemed to be likely to engage in preparations. Of the total number of respondents, 423 (61.2 percent) reported having some kind of emergency kit or supplies set aside in the event of such an emergency.

Demographics, storm preparation, and information seeking

The second and third research questions addressed whether or not demographic differences would predict crisis preparation and information-seeking behavior. A series of Chi-square tests of proportion were used to detect differences across sex, race, and income in terms of what groups were more or less likely to have prepared for the storm, whereas a series of mean comparisons was used to evaluate...
aggregate information seeking. The relationship between age and these variables was evaluated using simple bivariate correlations. Posthoc analyses were then used to articulate the details of these findings.

**Crisis preparation**

The findings for age indicated that older respondents were less likely to have an emergency kit in place, $r = -0.210$, $p < 0.001$. They also indicated that older respondents were less likely to have developed an evacuation plan, $r = -0.146$, $p < 0.001$.

Cross-tabulation analyses for sex failed to reveal differences between men and women both in terms of their likelihood to have an emergency kit prepared, $\chi^2 (1, N = 684) = 0.374$, (non significant), and in terms of having an evacuation plan, $\chi^2 (1, N = 686) = 0.089$. Significant differences were detected between white and non-white respondents. A total of 71.3 percent of the Caucasian respondents had an emergency kit when compared with 55.7 percent of the non-white respondents, $\chi^2 (1, N = 681) = 16.21$, $p < 0.001$, $V = 0.154$; 57.6 percent of the Caucasian respondents had an evacuation plan in place when compared with only 47.2 percent of the non-white respondents, $\chi^2 (1, N = 683) = 6.98$, $p < 0.008$, $V = 0.101$. Significant differences were not detected for income on the likelihood of either having an emergency kit or an evacuation plan.

**Information seeking.** To explore the impact of demographic characteristics on information-seeking behavior, a series of mean comparisons explored differences in information seeking across each of these groups, along with a simple bivariate analysis between age and information seeking. Older respondents reported more aggregate information seeking, $r = 0.168$, $p < 0.001$. Women reported more information seeking than men, $t(671) = 2.72$, $p < 0.007$. Significant differences were not detected between Caucasian and non-Caucasian respondents.

**Posthoc analyses.** Next, a series of one-way ANOVAs explored the differences in mean scores of the individual information-seeking items across African Americans, Caucasians, and other ethnic groups. Despite an absence of differences between whites and non-whites in aggregate information seeking, the results of these comparisons indicate that African American respondents were more likely than whites to seek information about government responses, $F(2, 658) = 4.94$, $p < 0.007$, $\eta^2 = 0.02$; evacuation efforts, $F(2, 652) = 3.43$, $p < 0.018$, $\eta^2 = 0.02$; and rescue operations, $F(2, 648) = 3.22$, $p < 0.045$, $\eta^2 = 0.01$.

Sex differences in information seeking were then examined with a series of t-tests, evaluating the differences between men and women in their perceptions of the importance of different types of disaster information. Mean comparisons failed to reveal significant differences between men and women on any of the information-seeking categories.

**Critical sources of information**

The hypothesis and third research question addressed the importance of various media channels in seeking information about the disaster. The first hypothesis posited that television and interpersonal channels would be reported as the most important sources of information about the hurricane and evacuation. As was the case following Katrina, the results strongly supported this prediction. A total of 675 of 691 respondents answered the question, identifying their most important information source; of these, 362 respondents (52 percent) reported that television was their primary source of information, 121 (17.5 percent) reported that face-to-face communication with acquaintances was most critical, and 12 (2 percent) reported relying on interpersonal communication with strangers.

The fourth research question addressed the relative importance of new media in information seeking about the storm. The results indicated that new media were almost entirely insignificant in providing information about the storm. Only 23 respondents (3 percent) reported finding out about the hurricane and evacuation via the Internet. Only 45 respondents (6.5 percent) reported communication over the phone as being the most important. Although the specific use of cell phones was not measured, aggregate phone use was dramatically less than primary information sources such as television and interpersonal exchange.
DISCUSSION

These findings offer useful information concerning crisis preparation, information needs, and communication patterns after Hurricane Ike, particularly when juxtaposed against similar data collected after Hurricane Katrina. The first area examined was crisis preparation. More than half of those affected by the storm indicated having an emergency kit or supplies when compared with less than half of those surveyed after Hurricane Katrina. Slightly more than half of the respondents indicated having an evacuation plan; a substantial increase of more than 33 percent was detected during Katrina. Income did not significantly predict any of the preparation outcomes; it may therefore be the case that the presence or absence of an emergency kit was not exclusively due to the ability to purchase one.

The memory of Hurricane Katrina, Rita, and Wilma may have contributed to the public’s understanding of the necessity of such a kit. Previous literature has supported the notion that, in general, those of higher socioeconomic status are better prepared for disasters than others. However, socioeconomic status did not positively predict preparation. This suggests recommendations counter to the initial drive of the study. Although further replication is necessary before reaching any definitive conclusions, it may be necessary that emergency managers should consider targeting broader audiences with messages promoting the assembly and storage of emergency kits. Considering the needs of at-risk and underprivileged audiences may actually be less of a concern for this particular act of preparation.

Furthermore, the larger proportion of respondents having a planned evacuation route may be directly related to the conditions surrounding Hurricane Rita. In 2005, the Governor’s Division of Emergency Management of Texas set up five regional evacuation plans and published details of relative flood risk for resident’s specific areas including what they should take with them when they evacuate. This, coupled with the experience of evacuating before Hurricane Rita, is probably the largest contributor to the improvements in evacuation preparations.

Consistent with the data collected after Hurricane Katrina, older respondents in both crises were less likely than younger respondents to have assembled some kind of emergency kit. Older respondents likely have more experience with Hurricanes; many hurricanes are fairly modest in impact, and those who have ridden one out with minimal experienced harm may be inclined to do so again. At the same time, conventional wisdom would state that the temporal proximity to Hurricane Katrina would alter these attitudes and reduce the influence of a disaster subculture.

The low rate of evacuation planning and the presence of an emergency kit among older populations may be influenced by another variable. As age increases, so does the physical and sometimes emotional difficulty associated with crisis and emergency preparedness. Specifically, this may come down to self-appraisals of one’s ability to engage in preparations. Research has found that older individuals lack confidence in their own ability to master a new skill; this may be a result of their own estimates of an inability to evoke the physical actions needed to evacuate. Other research has found that older individuals may not expend the effort to learn new abilities unless they believe that mastery of the skill is possible. The self-efficacy problems of the elderly may therefore be due to misappraisals of their own capabilities. There may be few predictable, uniform declines in beliefs of self-efficacy in old age, and as individuals’ physical capabilities decrease with age, reappraisals of self-efficacy are necessary. Those who compare their abilities to people of their own age may be less inclined to feel powerless than those who compare themselves to younger individuals.

In terms of practical implication for emergency managers designing and implementing message campaigns, it is worthy of note that when individuals observe a similar model performing a task successfully, this experience helps to bolster their own self-efficacy. As crisis and emergency messages are usually broadly targeted and not tailored to specific audiences, older individuals may have fewer opportunities to observe behavioral models of the same age for successfully navigating an evacuation. Thus, general modeling in a crisis event may prevent older adults from gaining the needed confidence to evacuate. These similarities in the results between Ike and
Katrina should motivate disaster researchers to re-examine their efforts to address the needs of older adults in the emergency planning process and to use diverse behavioral models in designing messages related to preparation, evacuation, and other disaster-related behaviors requiring some degree of physical exertion. Targeted messaging through the use of similar people as behavioral models may effectively boost self-efficacy among this particularly at-risk group.

Race, sex, and information seeking

As with Hurricane Katrina, results indicated that, in general, women and African Americans were significantly more likely to engage in information seeking. Although differences on specific items did not emerge in the gender comparisons, women still reported greater levels of information seeking after the storm, a finding that has been replicated consistently across crises studies. This offers continued support for the notion that women may tend to translate a relational orientation (ie, concern for relationships) into a problem-solving orientation (ie, “what information do I need to minimize the harm to my family”); this process is facilitated through information seeking. Emergency managers should then consider appealing specifically to female audiences in terms of message placement, especially concerning those messages that are closely related to both emotional needs and survival.

African Americans were more likely than others to engage in information seeking, possibly suggesting a need for more information or additional confirmatory information among this segment of the population. Recent research suggests that this lack of awareness and/or perceived lack of reliability of information may stem from trust issues concerning centralized information sources. For example, Spence et al. found that during Hurricane Katrina, minority respondents were less likely to accept a risk or warning message as credible without first verifying the information through interpersonal channels. The lack of trust between the African American community and the government concerning disaster response is well documented; this lack of trust may be an indicator why members of this community sought more information in the specific areas of government response, evacuation efforts, and rescue efforts.

These results further support the argument that emergency message must be tailored to specific audiences. The likely outcome of distrust of centralized information is the existence of subpopulations who have not received adequate information, have not been appropriately motivated in terms of response, and/or who may not be aware of pragmatic steps to take to avoid the threat presented by a given crisis. Therefore, emergency managers should not only consider the informational needs and dependencies of minority audiences but should also consider the role of other nonmediated sources that may be deemed more trustworthy by a given community. For example, partnering with community, educational, and faith-based organizations to create emergency awareness and preparedness campaigns may be a more effective communication tool in minimizing the negative impact of emergencies and disasters.

Media use

As with numerous documented crises, television was the primary resource for information acquisition. The mass media is a dominant source used for information in a crisis, and again respondents of this study indicated television as being a critical source, followed by interpersonal exchange as a secondary source of indicated importance.

New media did not emerge as viable means of communication. Similar to the findings obtained following Hurricane Katrina, very few respondents reported relying on Internet communication (3 percent). Results suggest that new media technologies have not yet emerged as a viable information source, at least not in the mind of the public. Respondents in both studies were also relatively unwilling to use mobile telephony to obtain information. Although services and circumstances are emerging that use cell phones and other types of mobile devices for emergency messages (for example, reverse 911 was used as a warning mechanism for the southern California wild fires), these technologies do not appear to have emerged as viable means of emergency communication.
Lessons for emergency practitioners

Effective communication is a key to understand how to most appropriately prevent, prepare, respond to, and learn from emergencies and other extreme events. Emergency practitioners still have much to learn about the unique and variable communication landscapes associated with disasters that vary in scope, size, and nature. Further, continued efforts are necessary to gain a better understanding of the most effective means of communicating critical information during highly variable crises. The current findings, coupled with findings following Katrina, suggest that specific areas such as crisis preparation have seen modest improvements in some populations, but information distribution needs further improvement.

Messages that motivate people to plan for and respond to potential risks need to be further studied, examined, and re-examined to determine their effectiveness. In addition, they need to be specifically tailored and directed at multiple audiences. More than half of the current sample had prepared for the storm or devised an evacuation plan, whereas less than half of the respondents after Katrina had taken such precautions. This likely demonstrates that learning took place after Katrina, and that post-Katrina emergency messages may have been somewhat successful. Hurricanes have longer warning periods than other disasters, which may allow for considerably more advanced notice. With this in mind, precrisis planning initiatives may hold significant promise for emergency managers’ effective message design and the most potential to improve safety and save lives in these specific disasters.

As with Hurricane Katrina, elderly populations and minorities indicated greater vulnerability. The results of the study clearly support the argument that African Americans were less likely to be prepared and have an evacuation plan than other ethnic groups. This suggests that the issues extend beyond income and that concerns related to culture, interpretation, and trust of government organizations may drive these inequities in preparation. Emergency managers responding to crises that affect diverse and/or at-risk subpopulations should more deeply consider the best messages and channels targeting these groups.

Furthermore, research and intervention plans should explore the effectiveness of community and interpersonal communication efforts related to emergency preparation.

A continued pattern of increased information seeking from women has been detected in research conducted in the aftermath of Hurricane Ike, Hurricane Katrina, the Minneapolis Bridge Collapse, and 9/11. Those crafting preparation messages must begin to consider men and women as separate audiences. Moreover, a program of research must emerge that looks at the information-seeking patterns of men to determine if men should ideally engage in more information seeking and how to facilitate this action.

Finally, new media technologies have not emerged as a strong source of information dissemination for a hurricane. Television and interpersonal channels are the best sources for alerting people to a crisis event. Although new media and their role in crisis and risk communication are a potentially promising area of study, these channels have not yet achieved a point of critical adoption that warrants policy considerations. From a message placement standpoint, it appears as though television may still be the best place for initial alerts. Short-term considerations in the face of an impending crisis still mandate that emergency managers use the channels most relied on by the public (typically television).

FUTURE DIRECTIONS

Although this study focused on a comparison of results between Hurricane Katrina and Hurricane Ike, not all the results are hurricane specific. Several are applicable to other crisis situations, and further research needs to examine issues of evacuation, information seeking, and media choice. Specifically, using models that promote action addressing both the issues of hazard (risk perception) and outrage (negative affect) have been found to be successful.

Differences in sex and information seeking have been observed across several studies; the next logical step in this line of inquiry is the use of this information to target and appeal to specific populations. Finally, these results should motivate crisis and emergency practitioners to begin looking at responses of various
publics across disaster types, with the goal of producing and disseminating highly targeted and effective messages.

LIMITATIONS

Field methods in emergency research are still largely unstructured, and scholars in this area frequently disagree about ideal methods of data collection, sampling techniques, and data analysis. This may be, in part, due to the fact that crises are, by definition, novel events; crisis researchers are still making sense of the best ways to address these concerns. The largest threat is potential coverage error. For example, residents of greater Houston who did not return within 5 days of the hurricane did not have opportunity to be included in the sample. Care must be taken when considering the generalizability of the findings, and it further highlights the necessity of replicating this research across multiple hazards.

Despite these limitations, one common source of agreement is that adherence to strict scientific procedures is often unrealistic under these circumstances, as crisis events are typically unpredictable and take place outside of the controls more typically associated with laboratory procedures.32

CONCLUSIONS

It is clear that differential patterns exist among subpopulations in terms of traditional media use, informational needs, and preparation for crises. Despite these demonstrated and theorized differences, emergency management officials continue to rely on the anticipated effectiveness of messages that fail to consider unique characteristics of various audiences. Through failure to consider these differences, emergency management officials and crisis communication practitioners run the risk that poor message design or placement may lead to a lack of response on the part of at-risk publics or even antisocial responses. We hope that these findings and those of past studies would motivate emergency planners to consider the responses of multiple groups that are likely to be affected by an impending disaster, giving some consideration to the best means of both producing and placing these messages.

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