

Vulnerability beyond Stereotypes: Context and Agency in Hurricane Risk Communication

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ABSTRACT

Risk communication may accentuate or alleviate the vulnerability of people who have particular difficulties responding to the threat of hazards such as hurricanes. The process of risk communication involves how hazard information is received, understood, and responded to by individuals and groups. Thus, risk communication and vulnerability interact through peoples' knowledge, attitudes, and practices. This study explores risk communication with several groups that may be at particular risk of hurricane impacts: older adults, newer residents, and persons with disabilities. Focus groups conducted in Miami, Florida, examined how members of these groups express their own vulnerability or agency in terms of receiving, interpreting, and responding to hurricane risk information. Findings indicate that people's interactions with risk information are deeply contextual and are facilitated by their individual agency to cope with their vulnerabilities.

1. Introduction

How do people who may be at particular risk of hurricane impacts receive, understand, and respond to hurricane forecast and warning information? To explore this question, we conducted research in a hurricane-prone region focusing on populations that can be characterized as being particularly vulnerable related to hurricane response. Vulnerability is broadly understood in the field of hazards research as differential susceptibility to damage or harm from a hazard, such as a hurricane (e.g., Hewitt 1983; Dow 1992; Bohle et al. 1994; Wisner et al. 2004;

Adger 2006; Morss et al. 2011). A common approach to vulnerability analysis is to identify populations based on demographic attributes (e.g., Morrow 1999; King and MacGregor 2000; Cutter et al. 2003; Emrich and Cutter 2011). Moving beyond identification of vulnerability, it is also critical to understand how vulnerability can be accentuated or alleviated by different processes. For example, the process of risk communication can influence vulnerability through its contributions to the knowledge, attitudes, and practices that underlie adaptive or coping capacity.

Social scientists have found that vulnerability to hurricanes and other hazards is shaped by sociocultural, economic, and political contexts (e.g., Oliver-Smith 2003; Laska and Morrow 2006; Phillips and Morrow 2007). Within groups designated as vulnerable, based on their sociocultural, economic, or political characteristics, closer examination often reveals active and resourceful individuals who, through specific coping mechanisms, demonstrate their individual agency (Smit and Wandel 2006).

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TABLE 1. Focus groups participant demographics. All 46 participants reported an annual household income figure of less than \$100,000, with 13 people reporting less than \$40,000.

Older adults focus groups (18 participants)	
Age	Range: 60–77 yr; mean: 67 yr
Gender	10 female, 8 male
Length of residence	Range: 3–61 yr; mean: 33 yr
Ethnicity	12 Caucasian, 4 Hispanic, 2 African-American
Some college education	10
Newer residents focus groups (16 participants)	
Age	Range: 25–68 yr; mean: 37 yr
Gender	8 female, 8 male
Length of residence	Range: 3 months–3 yr; Mean: 16 months
Ethnicity	11 Caucasian, 2 Hispanic, 2 African-American, 1 Asian
Some college education	13
Persons with disabilities focus groups (12 participants)	
Age	Range 26–68; mean: 50
Gender	8 female, 4 male
Length of residence	Range: 1–30 yr; mean: 19 yr
Ethnicity	9 Caucasian, 1 Hispanic, 2 African-American
Some college education	12

Agency is the capacity of individuals to make decisions and act independently while interacting with structures and institutions embedded in broader sociocultural, economic, and political contexts. Thus, an analysis of the interactions between vulnerability and risk communication must consider both these broader contexts and individual agency. Here we study these issues as part of a larger research effort examining the communication of hurricane information, including how risk messages are constructed and conveyed (Demuth et al. 2012).

2. Methodology

We designed this study to explore risk communication with several groups that are often identified as more likely to encounter difficulties when a hurricane threatens. Specifically, we examined how members of these groups express their own vulnerability or agency in terms of receiving, interpreting, and responding to hurricane risk information.¹ Six focus groups were conducted with older adults, newer residents, and persons with disabilities living within coastal areas of Florida's Miami-Dade County.² We selected the research site because of its diverse population and hurricane-prone location. Historical records indicate that Miami-Dade County, Florida,

has the highest exposure to hurricanes in the United States (Zandbergen 2009); Hurricane Andrew destroyed much of southern Miami-Dade County in 1992 (Peacock et al. 1997), and it was more recently impacted by Hurricanes Katrina and Wilma in 2005. Two focus groups each with older adult and newer residents were recruited through and held at Ask Miami, a research facility. Two focus groups with people with disabilities were recruited through and held at the Center for Independent Living in Miami.³ Demographic information for study participants is provided in Table 1.

We selected the focus group methodology to explore and to assess the similarities and differences expressed by participants in the focus groups, including how access to hurricane information, understandings, and responses differ by social groups (Conradson 2005). Focus groups also indicate how people discuss an issue in their everyday interactions in a sort of "collective conversation" (Kamberelis and Dimitriadis 2008, p. 375). For example, participants in the hearing-impaired focus group illustrated their everyday communication practices by using cell phones during the focus group to communicate through text-based messages.

The focus groups implemented here were not intended to generate comprehensive or generalizable data or to indicate consensus on particular issues. Rather, they enabled exploration of the issues by encouraging a range of responses about meanings, interpretations, and experiences

¹ Although focus group questions focused primarily on communication of information, some groups talked also about hurricane response.

² Although linguistic and cultural factors influence the receipt and comprehension of and response to hurricane information (e.g., Perilla et al. 2002), we decided to not specifically study Spanish-speaking populations because of the prevalence of Spanish-language media in the Miami area.

³ While this study carries a bias toward people who engage with these facilities, we think that the insights are broadly relevant for communicating hurricane risk information.

that members of the selected groups have of hurricane forecast and warning information. Because individuals' statements within a focus group are influenced by interactions with other group members, data from each individual cannot be considered as independent observations. For these reasons, we express the results of our research with comparative descriptions (i.e., "a major theme") as opposed to quantitative terms.

Following standard focus group procedures (Krueger 1994; Morgan 1997), we developed and followed a general interview outline to elicit data on topics of interest. We asked questions about participants' hurricane experience; perceived likelihood of impacts; sources of hurricane information; responses to hurricane threats, such as information-seeking behavior; and receipt and interpretation of hurricane forecast and warning information.⁴ Follow-up questions were asked as appropriate to investigate topics raised by participants in greater depth. While the primary discussion questions were the same across the three groups, the resulting conversations revealed the specific perspectives of the focus group participants. By allowing participants to share and contrast their perceptions and experiences, this work complements and extends previous interview-based studies on the influence of hurricane information on decision making (i.e., Taylor et al. 2009). We transcribed audio recordings of each focus group. Appropriate to our data collection method, we qualitatively analyzed the transcripts through an inductive approach that allowed us to identify analytic categories and concepts and link these to relevant social science theories (Bernard 2002). These analytic categories that emerged from the data included primary or trusted information sources, barriers to receiving and understanding information, reliance on social networks, and the role of previous experiences.

3. Older adults

The two older adult focus groups included a total of 18 participants with a mean age of 67 (see Table 1). Because the participants had the health and mobility to volunteer for the focus groups, they do not necessarily have the same physical vulnerabilities to taking protective action that are often of concern with "elderly" vulnerable populations. All but one of the participants had lived in the Miami area for more than 3 yr and had some hurricane experience, including several individuals that had been impacted directly by Hurricane Andrew. Thus, a major theme of these focus groups was how

participants' experiences with hurricanes and familiarity with hurricane risk communication combined with other factors to influence the way they perceived and responded to hurricane risks (Barnett and Breakwell 2001).

Most of the older adults had well-formed opinions about where to go for different types of hurricane information and which sources they find relevant, trustworthy, and easiest to understand. For example, some participants named specific local broadcast meteorologists as a preferred source (see also Sherman-Morris 2005). Based on their experience, several talked about improvements in forecasting that increased their trust in the information: "with today's technology, they are more precise than back in '92 [the year of Hurricane Andrew]. In other words you count on [the National Oceanic and Atmospheric Administration's National] Hurricane Center to give you good information." Another added: "The cones are more accurate now...you can watch the different lines and see what the chances are." These perceptions agree with recent improvements in hurricane forecast accuracy (see Willoughby et al. 2007).

Running throughout the discussion was a strong sense of individual agency: the older adult participants felt they knew how to acquire and understand the information needed if a hurricane threatened, and what to do and how to obtain any required help from friends and family. They also emphasized the role of their previous hurricane experience in making preparation decisions. Most said they knew whether they lived in an evacuation zone. Regardless of their home location, nearly all said they would not evacuate. The reasons given for not evacuating included feeling safe in their homes (e.g., if they have storm shutters or wind-resistant windows or live outside storm surge areas); not knowing where to go, especially with a pet; and realizing that even with improved hurricane forecasts it can be difficult to know where the hurricane will hit (see also Gladwin et al. 2001). Even with the expressed reluctance to evacuate, a dominant theme reported by participants was a sense that local or national government postdisaster assistance was unreliable, and that "the scariest part is afterwards" when people might experience loss of power and other community services for extended periods. This indicates the importance of preparing for not only the impacts during the hurricane, but also the aftermath, and that communicating the impacts in the poststorm period may be important for people's prestorm decisions.

4. Newer residents

The two newer-resident focus groups included a total of 16 participants who had moved to Miami-Dade County within the last 3 yr (see Table 1). None of the

⁴ The focus group interview protocol is available by request from the corresponding author.

newer residents had local hurricane experience, although one recalled experiencing Hurricane Katrina while living in Orlando 2005. Newer residents thus lacked the experience that informed the perceptions of most of the older adult participants, which was an important distinction in their perspectives on hurricane forecasts, warnings, and decisions.

Newer residents mentioned seeking hurricane information on television, the Internet, and radio. However, compared with the experienced older adults, they were not specific about the stations or sites they would check. They did not demonstrate strong allegiances to particular local television channels or broadcast meteorologists, and the channels and websites mentioned tended to have national scope, such as The Weather Channel.

Reflecting on their own lack of hurricane experience, newer residents reported that they had or would leverage local social networks to learn about hurricanes and what to do in the event of a threat. These networks were described as including family, friends, neighbors, coworkers, landlords, and community and religious leaders who had lived in the area longer and were trusted sources for information, interpretations of the information, and preparation measure suggestions. For example, one newer resident said he had sought out the expertise of “[p]eople who have been here through the last few [hurricanes]. . . I belong to a fraternity so my network is pretty wide.” Another described how he would rely vicariously on the experiences and local knowledge of “a couple really good friends that live on [Miami] Beach and have been here for years and years, so I’d call and ask [them] what to do.”

Consistent with previous research (Bostrom 2008) many newer residents discussed hurricanes using analogies to other types of hazards that they had experienced in areas where they had previously lived. Analogies helped them describe how they would prepare if a hurricane threatened and demonstrate some individual agency in responding to the hurricane. For example, one woman who had moved to Florida from California described how she brought her “emergency first aid kit from San Francisco to here. . . . I still have my little ‘get ready and go bag’ [that I made after] the first [earthquake that I experienced].”

Compared to most of the older adults, newer residents discussed far fewer details about hurricane preparedness measures or evacuation decisions. In one focus group, none of the participants indicated that they knew whether or not they lived in an evacuation zone. In both focus groups, the newer residents appeared vague on what information they would need to help decide whether or not to evacuate and, if so, where they would decide to go. Those that did state they would evacuate mentioned that they would likely stay with family elsewhere in Florida,

return to their previous out-of-state homes if time permitted, or rely on the evacuation plans of their employers. Although able to harness social networks and refer to hazard analogies, newer residents may be unfamiliar with the channels and messages used in communicating hurricane information. This indicates the ongoing importance of hazard education and risk communication, with some effort focused particularly on identifying and informing new residents.

5. People with disabilities

The two focus groups for people with disabilities included a total of 12 participants (Table 1). Types of disabilities include physical, cognitive, mental, sensory, emotional, and developmental (WHO 2012); given our focus on risk communication, we focused on disabilities other than physical limitations that could inhibit evacuation. We conducted one “hearing-impaired” focus group, in which participants were deaf or hard of hearing and one “non-hearing-impaired” group, in which participants had a variety of other disabilities. All but one participant spoke of having some personal hurricane experience, mostly in the Miami area.

In the non-hearing-impaired group, participants stated that they received information about hurricane threats primarily from television, with only a few mentions of the Internet or radio. One participant demonstrated agency in how she copes with discrepancies in hurricane forecast information by seeking multiple sources of information: “I just go to each [station] and see what they say and then I draw a conclusion.” Participants also reported that they were likely to contact friends, family, and caregivers for information. One theme that emerged in this group as a barrier to receiving and interpreting information was intentional information avoidance in order to control fear and anxiety (Johnson 2005, Roberto et al. 2010). For example, one participant discussed her extreme anxiety associated with hurricanes, which she described as arising from sensationalized reporting in the news: “If I didn’t feel safe I’d probably just take one chair and go sit in my storage room which is in the middle of the house. . . . And I’d put my lamp on and read. I’m not going to let everything get me crazy. . . I just take myself mentally and put myself elsewhere—in a book.” This coping behavior could enhance her vulnerability when a hurricane threatens; however, her longer-term preparedness measures help to make this avoidance response safer because she has chosen to live on bus routes, in proximity to both the hospital and police station, and within walking distance of a center for people with disabilities where she works and knows she can receive assistance. Both her emotional management and preparedness are examples

of how she exhibits agency. Further work is needed to understand to what extent these findings are specific to people with disabilities and how these issues might be influenced by conditions of disability.

The participants in the hearing-impaired group relied primarily on networks of friends and family (both hearing and nonhearing) to receive and help understand hurricane information. While cell phone and texting technology have significantly facilitated communication with and among deaf and hearing-impaired people, the reliance on cell phones leads to other problems. Deaf participants reported instances when their cell phones had been rendered useless when cell phone towers become overloaded or electricity went out and phones could not be recharged.

Hearing-impaired participants also discussed communicative barriers to receiving and interpreting information. Problems include the lack of captioning on live broadcast television; overlapping frames on television screens that block the captioning or the interpreter; an inability to understand American Sign Language (ASL), especially for the two non-English-speaking participants in the group; and an inability to understand the interpreter (even for people who can lip read, it is difficult to do so on TV or movie screens). One deaf participant explained the problem with interpreters on TV: "When you have a warning. . . and they have the bubble with the interpreter next to the Mayor or whatever. . . There's a communication breakdown. It's hard to understand the interpreter because often they bring in those interpreters who are not skilled. . . Maybe they don't understand [the threat] clearly." Participants suggested that two interpreters were needed: one to translate the message into ASL and a local deaf interpreter to translate the ASL into locally understood signing. To ensure that hearing-impaired populations receive and understand hurricane risk messages, such technological and communicative vulnerabilities are important for television broadcasters and emergency managers to address.

6. Discussion

This study explored how members of three groups often identified as vulnerable (older adults, newer residents, and people with disabilities) in Miami, Florida, express their vulnerabilities with regard to accessing, comprehending, and responding to hurricane information. Findings indicate that people's interactions with risk information are deeply contextual and are facilitated by their individual agency to cope with their vulnerabilities. People's coping or adaptive capacities—the learned adjustments that may ameliorate personal vulnerability—are important mechanisms to help them

obtain, interpret, and use information about hurricane forecasts and warnings. Participants in the focus groups demonstrated a range of hurricane information sources. Older adults described their trust in local television stations and broadcast meteorologists while newer residents mentioned national television and Internet sources. Both newer residents and people with disabilities reported seeking information from social networks.

Problems with the communication and understanding of hurricane information arose in each group; the reliance of older adults on past experience and of newer residents on hazard analogies may empower them to cope with future storms but may also mislead their decisions and actions (Morss and Hayden 2010), especially given variability between hazards and hurricanes (Malmstadt et al. 2009). A major theme in the non-hearing-impaired focus group was emotional response and anxiety brought about by sensationalized reporting in news about impending hurricanes. Participants reportedly addressed this by triangulating between information sources or practicing information avoidance. Participants in the hearing-impaired focus group emphasized problems with television as an information source, including difficulties understanding sign language interpreters.

These findings all have implications for the communication of hurricane information. For example, risk communication about hurricanes might relate the forecasted storm to previous events to help people contextualize the threat, include special information for people who are not familiar with Miami-Dade county or hurricanes, reduce sensationalism, and be aware of interpretation problems for people who are hearing impaired.

7. Conclusions

In summary, most of the older adults who participated in our focus groups had lived in the Miami area for many years. As a result, they demonstrated a wealth of experience and local knowledge that may inform their understandings about hurricane risks, trusted information sources, and preparedness activities. Newer resident participants lacked this local hurricane experience and attempted to compensate for it by relying on analogies to other hazards and the experiences and knowledge of those in their local social networks. However, older adults' expectations based on past experience and newer residents' reliance on risk analogies may cause problems during future hurricanes because there is great variability between hazards and even between different hurricanes. People with disabilities harness their community resources, communicate with close friends and family, and adjust the use of technology to their needs where possible,

but they also encounter significant barriers to accessing and interpreting hurricane information.

To understand and improve hurricane risk communication, it is important for communication researchers and practitioners (such as forecasters, media broadcasters, and emergency managers) to recognize that there is not a linear relationship between the attributes of members of a population and their vulnerability to certain threats. Demographic indicators are a useful starting point for vulnerability analysis. Ultimately, however, vulnerability is a complex, nuanced concept that cannot be fully characterized by sociodemographic characteristics—vulnerability “stereotypes”—such as age, years of residence, or disabilities. Rather, there are intervening factors, such as individual agency, that are critical for understanding how people respond to and are affected by hazards, including how they receive, comprehend, and take action based on hazard information.

The research results presented here are exploratory and warrant further investigation on issues such as the role of previous experience in older adults' expectations of the future, the newer residents' reliance on hazard analogies, and the nuances of receiving hurricane information by people with disabilities. We encourage further attention to why and how people are vulnerable with regard to receipt and interpretation of hazard information in the hope that informing effective risk communication can help alleviate vulnerability and reduce the negative outcomes of hazardous events on vulnerable populations.

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