Making Sense of Hurricanes: Public Discourse and Perceived Risk of Extreme Weather

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Abstract

Our case study of hurricane risk and emergency communication in a high-risk county on the US southeastern coast shows residents actively processing information available in public discourse about hazardous storms. To construct meaningful assessments of personal risk, local people interpret and evaluate alternate representations of storm events produced by government emergency managers, local and national news media, and commonsense local lore. Using combined methods, we analyze empirical evidence of narratives communicated by residents and by journalists. As contribution to study of risk perception, this article describes mechanisms of interpretation and evaluation by which people perceive weather-related danger and make judgments about it.

Keywords: Risk communication, narrative, discourse analysis, risk perception.

1. Introduction

When hurricanes and tropical storms approach coastal areas of the United States, residents of communities facing these hazards do not all, or always, act in accordance with official preparedness advice, advisories, watches, warnings, and evacuation orders. In fact, a 2008 Harvard School of Public Health survey of over 5000 U.S. coastal residents that found the following:

> Despite the destruction caused by hurricane Katrina, a sizeable number of people living in high-risk hurricane areas say they would not evacuate due to a major storm if government officials said they had to leave. Nearly one in four (23%) Katrina-affected respondents and 28% of other high risk area respondents would stay in their homes. (Harvard 2008)

This finding is consistent with the results of a pilot study of risk and emergency communication related to hurricanes affecting North Carolina that we conducted in 2007 and we report on here. We found, for example, that 33 of 47 residents of a high-risk coastal county who responded to questions about evacuation did not evacuate for Hurricane Isabel in 2003, the most recent major hurricane to affect the state. This is despite official warnings by emergency managers urging 75,000 coastal residents to leave. Hurricane Isabel was a huge tropical system that at one point reached Category 5 on the

Saffir-Simpson scale (165 mph + winds) and landed on the North Carolina coast as a Category 2 storm with winds in excess of 100 mph. Ultimately, Isabel caused twelve deaths in North Carolina, created a 2,000 foot inlet across one of the barrier islands that stranded residents in several communities, and caused $495 million dollars in property damage in North Carolina alone.

Given the seriousness of the storm, why did some residents stay in coastal areas even after mandatory evacuation orders were issued? On what basis do people make decisions about such risks?

Coastal residents are confronted with a number of decisions and choices when severe weather approaches their communities. They make decisions based on a variety of factors and their perceptions of risk from a storm rest on their individual interpretations of information about the storm. By interpretation, we mean sense-making, or dynamic processing of discourse by individuals living in a region of probable hurricane activity as they attend to news stories, weather forecasts, official advisories and warnings, and orders to act issued by local emergency managers in response to a storm. The discourse is characteristically multi-sourced, multi-mediated, with decentralized authority for representations of weather conditions and effects. Residents access information, sort its potential meaning for them personally, and construct individual perceptions of risk according to direct personal experience or familiarity with others' experience. The complexity presents ambiguity that participants must resolve to judge what risks and hazards they face and to decide how to act in response. At the same time, multiple versions of events and individuals' narratives—stories about the events—co-construct a larger community narrative that in turn shapes residents' perceptions of themselves as members of a community (DeFina 2008) that shares a specific type of risk.

In this discussion, we first briefly review risk and the factors that influence risk perception and describe the context for the communication that surrounds severe weather events in coastal North Carolina. We then explain the pilot study we conducted in that area and from which our narrative data emerged. We present and analyze several examples of narratives—stories of experience that are shaped by culture and context—constructed by officials and media primarily responsible for informing the public during an event and by residents who are, essentially, responsible for their own safety during severe weather. Finally, we conclude by summarizing the ways in which stories about storm experiences from different sources co-construct a community narrative that also shapes participants' perceptions of risk.

2. Risk, Perception, and Communication

Natural hazards such as hurricanes cause real damage to life and property. Risks from these events, on the other hand, can be thought of as the likelihood or probability that a negative outcome will result from a specific source, event, decision or behaviour. 'Risk' is described as socially constructed, as a measurement of the probability that an event will occur, and as the potential for the relationship among danger, decisions, and potential loss to result in a

negative outcome (Renn 2008; Taylor-Goolby and Zinn 2006; Sjöberg 2000; Luhmann 1993).

Scientific, technical, and probabilistic information generated by expert risk analysis is not well understood by the public (Handmer and Proudley 2007; Keller et al. 2006; Gigerenzer et al. 2005). However, research on risk perception has demonstrated that decisions about risk for both expert and lay audiences are based not only on technical information but also on personal and social considerations. Factors that influence risk awareness and perception include the level of media focus on an issue, trust in information and in the sources providing information, risk-benefit tradeoffs, proximity (the closeness of personal experience to a risk), level of uncertainty, and place-based considerations (Paton 2007; Masuda and Garvin 2006; Roepik and Slovic 2003; Baron et al. 2000; Rosati and Saba 2004; Sapp 2003; Grabill and Simmons 1998). In addition, as Jeffrey Masuda and Theresa Garvin argue, 'where risk perception research traditionally viewed individuals as atomized units unconnected to a social system, we now understand risk as embedded in social context....risks are situated within the social experiences and interactions of individuals, groups, and institutions (Scherer and Cho, 2003)' (p. 439). Approaching risk perception from the perspective of cultural geography, Masuda and Garvin suggest a 'definition of culture as the social and material processes and outcomes of contested meanings attached to place' that includes 'the taken for- granted practices of everyday life' (p. 440).

We understand the 'taken for granted' to include the discourse about risks in which people participate in different ways. Part of this discourse is risk communication, which focuses on developing information about risks, providing information to the public, and engaging governments, stakeholders, and publics in evaluations of and decision-making about risks. A significant body of literature about risk communication emerging from the fields of 'risk assessment, cognitive psychology, and communication' and technical and professional communication (Grabill and Simmons 1998), encompasses a variety of issues and related research methods (both quantitative and qualitative) for evaluating the ways that information about risks and risk mitigation is prepared, disseminated, and evaluated.

Risk communication practices, processes, and products are embedded in social and cultural realities deserving of study if we want to understand how communication functions, and how it fails. Consequently, we draw on discourse analysis to bring attention to the symbolic, mediated, and lived aspects of risk and related communication. Discourse analysis illuminates functional and purposeful symbolic actions and interactions, with emphases on understanding the socially constructive roles of language and media use and on understanding ways in which language and media relate to settings of use. These approaches provide a framework for identifying pragmatic, contextual, and situational influences on text production, reception, and use as factors in risk communication.

3. Pilot Study Background

We conducted a pilot study of risk communication related to severe weather hazards in Dare County, North Carolina, U.S. Dare County is the easternmost edge of North Carolina and includes a long chain of barrier islands referred to as the Outer Banks. The coastal area of North Carolina that includes Dare County has one of the largest systems of estuaries in the world and is a popular vacation destination from May through September. The vacation season also coincides with much of the Atlantic hurricane season, which peaks in September. About 33,500 people live year round in the county, double the number of inhabitants since the 1980s. The year-round population more than doubles seasonally with the influx of tourists. As a result, the need for risk management and risk communication is continually growing as well.

Our pilot began at a workshop held in 2006 for emergency managers and public information officers from several North Carolina coastal counties, university researchers studying coastal hazards, and representatives of the media who participate in providing risk and emergency information to the public. The goal of this meeting was to bring together stake holders for a discussion of risk communication challenges. During this workshop, we began to learn about the problems that emergency management personnel face when communicating with the public.

Subsequently, in 2007 we conducted our pilot study to address several questions about risk communication related to severe weather and to lay the ground work for a larger study that we are currently conducting. We wanted to find out about the attitudes of local officials and full-time residents towards risks prior to, during, and after weather emergencies. We wanted to learn about communication factors that influence how residents perceive and respond to the risks of severe weather hazards such as hurricanes. In particular we were interested the ways that official and unofficial information sources, social networks, and local norms influence perceptions of risk, decisions about actions in a crisis, and considerations for future actions. The overall goal of the pilot was to better understand what strategies are effective in communicating about risks—both imminent and long term—from severe weather events and from local conditions that contribute to damage.

In hurricane-affected regions such as North Carolina, local governments and media provide region-specific public safety information about risk and associated hazards. Government at all levels shares responsibility for hazard management and risk or emergency communication as a function of public safety. At the local level, counties and municipalities are the first responders in any emergency. They develop their own plans for preparation and response including communication plans. These plans are shared and coordinated with state, regional, and federal departments and agencies, as well as responding nongovernmental organizations such as the Red Cross and the Salvation Army, and other entities involved in emergency response. Local government agencies have primary responsibility and direct the overall effort.

Additionally, in locales that are regularly affected by natural disasters, longstanding practices of community response include unofficial ways of supplementing official communications. For example, in the region of our study a resident who officially served as municipal emergency manager, public

information officer, and volunteer fire-fighter told us that, when the infrastructure reliant on electrical power fails:

> It's the coconut telegraph. Word of mouth, usually by phone. Normally someone who has a battery scanner or who's house is on a generator and they have a scanner hears us on one or all the local frequencies, sheriff, fire, EMS, rescue and especially the local [amateur radio] Ham Repeater. The phone tree gets going, as long as there is dial tone. And that's another story. (Smith 2007)

Situated between government and the public are various media sources—television, radio, amateur radio, newspapers, and the Internet—that generally serve in both official and quasi-official capacities to provide weather warnings and additional emergency information.

When a hurricane approaches North Carolina's coast, information about the storm's development circulates among the National Weather Service's (NWS) Hurricane Center; regional NWS field offices; commercial weather information providers; national mass media weather news outlets such as The Weather Channel; local newsprint and radio media; local government emergency management, and the populations living in regions that may be affected. Within a region, the circulation widens as new information about the anticipated storm mingles with old information about past storms. All of it is actively discussed in social networks of co-workers, families, and neighbors in routine interactions at, for example, grocery or hardware stores (Ward). This multi-mediated flow of mixed official and unofficial information constitutes an aggregation of communicative activity that we refer to as the public discourse of hurricanes.

In the following discussion we focus on three types of participant in the public discourse: emergency managers, public communicators, and residents. As a type, public communicator involves two categories of participant: government public information professionals and news media professionals. Narrative is commonly, yet differently, used as an interpretive mechanism by each of these participant types.

4. Pilot Study Methods

The data in our field study were gathered at the 2006 workshop and a subsequent one in 2007, at which we recorded discussion, and in interviews. We conducted face-to-face, semi-structured interviews with 76 residents in various locations throughout the county. During the interviews, we collected information about all sources that participants used for weather information, including how frequently they consulted sources and how they rated the information they received; their previous experiences with severe weather; their activities before, during, and after storms; and the factors they considered when deciding how to respond to threats from serious storms. Twenty of these residents participated in document-based interviews.

We also collected samples of print materials about weather risks and storm preparation that were available to residents from various sources in the county. These materials included information provided by business and government sources such as preparedness checklists and storm tracking

maps. One of these documents, a *Hurricane Survival Guide* produced by county government, was used during the twenty document-based interviews. The guide provides information about preparation, evacuation, and re-entry to the area after an evacuation. In these interviews, residents read the guide and evaluated its content using a 'plus-minus' markup of the document (de Jong and Schellens 2000; de Jong and Rijnks 2006). Residents marked with the plus symbol (+) content they had a positive reaction to for any reason and marked with the minus symbol (–) content they had a negative reaction to for any reason. After residents read and marked the guide, interviewers asked the residents to elaborate on the meaning of their marks. Residents were asked what each plus or minus symbol meant or, in other words, why the residents had marked particular sections of the guide as they did. Using the markings on the guide as prompts, interviewers asked interviewees to explain their plus or minus marks placed near particular sections of the guide.

For these interviews, we were not interested in the residents' evaluations of the guide. Rather, we were interested to learn how residents' evaluation of the guide's content would elicit information about their experiences of living in a hurricane-affected region, either the interviewee's direct experience or the reported experience of others. Reactions to the document served as the basis for discussion rather than open-ended, thematic questioning. For purposes of descriptive analysis, the interviews with residents were transcribed to capture, verbatim, the lexical and syntactic content without regard for other linguistic or paralinguistic features.

In these methods of qualitative research, the topic is the lived world of subjects, their relationship to it, and their perspective on it. Subjects in our study freely expressed knowledge, belief, ideas, or attitudes while interviewers, taking a stance of deliberate naïveté, asked interviewees to explain what they meant (Kvale 1996). One potential drawback of the interviews is the distance in time between the interviews and the participant's experience of severe weather. However, for our purpose of understanding the participants' perceptions of risk, distance from an actual emergency situation is taken to be a contextual condition of the coastal residents' subjective experience. For six months of the year, they live with the *potential* that a storm will develop and the *possibility* that it will make landfall in their area—in other words, they deal with the risk regularly but with the hazard periodically. One consequence of this context is that the residents are also routinely relating to a discourse of preparedness.

The validity of responses in this way of interviewing does not, as in other social science interviewing, rely on making distinction between respondents' explanations for their behavior and post-hoc rationalizations. Reliability of after-the-event interview data (e.g. reactivity, consequences of self-presentation, cognitive dissonance) is not a significant issue when what is being explored is how people make sense of experience. Sense-making is worthy of study as cognitive activity, without regard for the truth value of the evidence to be analyzed.

5. Representations of Risk

Next in this discussion, we turn to sources of ambiguity in public information. Specifically, we focus on different representations of hurricane survival introduced by local government emergency managers and news media.

5.1 Instrumental Discourse of Officials

In our study site, local government emergency public information officers communicate extreme weather advisory information year-round and especially during hurricane season (June to November) and tropical storm season (November to March). Many specialized communications are conveyed in print, television, and Internet media. The county's guide to hurricane survival used for our study is an example. In that guide, timed for release when a seriously threatening storm approaches, residents are advised to prepare both for evacuating and for staying. In text columns directed to the year-round resident audience, checklists of necessary actions are offered under two headings, 'if you go' and 'if you stay'. Other text columns directed to the tourists and visitor audience present evacuation as the only option, 'leave immediately'. For the year-round resident audience, evacuating and staying are presented as equal options, a presentation that caused confusion for the residents who participated in the document-based interviews.

The problem reflects limitations on US governmental risk management. Despite policy and law requiring local government to order evacuation if hurricanes reach a specified intensity level (Level 2 on the Saffir-Simpson scale), elected officials and emergency agency managers cannot force people to evacuate. Essentially, residents choose whether to stay or to leave.

Emergency assistance ceases at mandated cut-off points (e.g. if winds exceed a specified velocity), and storm conditions might overwhelm the capacity to provide emergency services. Residents who choose to stay must rely on their individual and communal resources and skills. This consequence is not stated directly in the guide. Instead, conditions are listed that a non-evacuator will likely face such as failures of electricity and supplies of clean water or food, isolation or drowning by polluted floodwaters, and injury or death caused by structural damage. These details imply an indirect narrative, what might happen. They call on imagination or evoke experience, in order to persuade. In interviews, we observed that such details triggered memories for residents who had experienced hurricanes, often prompting them to offer stories to agree with, disagree with, or qualify the implied narrative.

Our analysis of the recordings from the workshops also disclosed a thematic contest of values, or struggle, between the professional goals and objectives of two social actors, local government public information officers and news media reporters. Source-journalist relations define a necessary interdependence of these two professions. However, the relationship is strained because they have different agendas. The media's information seeking can add a burden to emergency managers who must protect journalists' safety during storm events. Similarly, local government information officers' adherence to sequenced, authorized announcements can frustrate journalists who must meet deadlines. In addition, the government

and the media tell different 'stories' about the same events. The following exchange between local government public information officers and local news media reporters attending one of our workshops illustrates inherent tension in the relationship.

> **Public information officer**: What guidelines do media use to keep from sensationalizing [hurricanes]?
>
> **Radio reporter**: We're a state-wide network and work with a state-wide audience. Coverage is broad and general. We are always looking for innovative ways to prepare people when storms aren't happening. Depends on if coverage is during the height of a storm or when we're still not sure whether it'll hit. . . It's a delicate balance. Hurricanes are stories that generate a lot of national interest.
>
> **Newsprint reporter**: We're multimedia now. Already online, going to be video next year. We used to think hurricanes were television stories and newspapers told people stories afterwards. Now we're moving to more 24/7 news coverage—anything from whether or not to boil water and where to get emergency help.
>
> **Workshop moderator**: What makes a story worthy of coverage?
>
> **Newsprint reporter**: Drama. Coping. Human element.
>
> **Public information officer**: Are we not giving you enough info to write stories regarding safety and public interest?

The exchange briefly shows source-journalist relations that might affect how hurricane risks are framed in the public discourse (Hughes 2006). Regarding a particular hurricane, alternate storm representations are produced locally and elsewhere for consumption across local, state-wide, and national media markets. Residents living in an affected region sort these representations, among other sources and personal experience, to perceive meaningful risk for their location.

Nohrstedt (2000) refers to some media practices as 'media dramaturgy'. Information is 'shaped according to stereotyped moulds: polarization, sensationalism (i.e., emphasis on aspects that are arousing but not necessarily important), personification, and story-telling, i.e., constructing a narrative structure with constitutive elements like 'problem – climax – resolution'' (p. 149). From the government information officer's perspective, the media's use of narrative to dramatize a storm can interfere with the uptake of important information.

5.2 Storied Discourse of the Media

Because of the media's pervasiveness, media accounts of risk and serious events shape the ways that people frame risks (Durfee 2006). To collect examples of media stories, we searched newspaper and wire service stories on Lexis-Nexis and on the Web for the two days that North Carolina was most affected by Hurricane Isabel, September 17 and 18, 2003. We located 848 stories from English language sources, 118 from North Carolina news media. Most of the North Carolina sources provided information about the location

and strength of the storm, regardless of the main topic of the article, and reported on mandatory evacuation orders. Perversely, articles that mentioned evacuations also told stories about and included quotes from people who planned to stay despite the orders. Typical examples include these:

> "Diehards stay; most flee beach." Hurricane Isabel was not about to force Bill Cherry off Topsail Island. (Fayetteville Observer, The (NC)-September 18, 2003. Author: Greg Barnes)

> "Isabel Heads For Outer Banks - Some Residents Decide To Wait Out Storm." Elaina Davis refuses to let Hurricane Isabel drive her away from the coast. Davis will throw a few planks across the French doors of her house at the southern tip of Roanoke Island, tranquilize her 200-pound hog and drag him in the garage, and wait out the storm. (Greensboro News and Record (NC)-September 18, 2003 Author: Alex Wayne)

Stories that mention the mandatory evacuations and also tell human interest stories about people who 'brave it out' reinforce the sense of choice about evacuation that we found presented in the *Hurricane Survival Guide*.

To provide manageable examples of the types of stories that the media generated, we use a set of the captions for photographs of coastal areas and residents during Hurricane Isabel, archived on CBSNews.com. These constitute very brief stories characteristic of people and activities with which the locals are familiar, suggest a range of options for responses to severe weather, and help to establish the community narrative about what it means to live on the coast and deal with the risks from storms. Thus, the caption texts and our analysis, presented in Figure 2, highlight ways that media stories about individuals reinforce commonsense lore recognizable to coastal residents.

6. Residents' Stories

The narratives we analyze in this section were embedded within conversations between and researchers and respondents during the document-based interviews. Unlike traditional narrative research (Labov 1992, 2006), in which narratives are elicited with questions such as 'tell me about the worst thing that ever happened to you', for the sake of studying narrative, the stories that emerged during our research were spontaneously generated by the speakers. However, in selecting what counts as narrative, we rely on characterizations of narrative from several sources. For our purposes, these stories tell about activities or occurrences that are sequenced in time (Labov 2006: 37), that are 'about something', and that the speaker judges to be 'reportable' (Labov 2006: 38). What we call narratives are similar to Alexandra Georgakopoulou's (2006) notion of 'small stories', her 'umbrella-term that covers a gamut of under-represented narrative activities, such as tellings of ongoing events, future or hypothetical events, shared (known) events, but also allusions to tellings, deferrals of tellings, and refusals to tell' (p. 123).

Figure 2. Analysis of Media Messages

Caption Text	Message Topic	Analysis
Floodwaters race through an RV park in Kitty Hawk, N.C., Sept. 18, 2003. Hurricane Isabel brought torrential rain and strong winds as it made landfall along the North Carolina coast. (CBS.com; AP/The Charlotte Observer) Cars head westbound on U.S. 7 out of New Bern, N.C., Sept. 17, 2003. Evacuation orders and Department of Transportation work on the roadway made traffic heavier than usual (CBS.com; Photo: AP/New Bern Sun Journal)	Conditions and warnings	These examples, though not narrative, illustrate media dramatically conveying information about conditions in the area. Accompanying the first text example was an image of streets flooded with over-wash being whipped by high winds. In contrast, local government reports of conditions are compatible with both the information needs of the public and the safety goals of emergency management.
Kelly Hull, top, and his wife, Cheryl, of Burke, Va., do some last minute preparations for Hurricane Isabel as they board up windows and doors on their beach house, Sept. 17, 2003, in Nags Head, N.C. (CBS.com, Photo: AP)	Preparing	Captions and images showing residents taking steps to prepare for storms support the message of emergency management. In addition, the narrative here is about self-protection, which is a tenet of preparedness.
Myron Thomas points to a high water mark as he stands outside his Sea Level, N.C. home, Sept. 17, 2003. Thomas has lived in Sea Level for 66 years and says he's never left during a storm. (CBS.com, AP photo accompanied)	Staying	This caption presents a short human interest narrative that may reinforce the lore of the self-reliant storm survivor.
Cars head westbound on U.S. 7 out of New Bern, N.C., Sept. 17, 2003. Evacuation orders and Department of Transportation work on the roadway made traffic heavier than usual (CBS.com, (Photo: AP/New Bern Sun Journal)	Evacuating/ Sheltering	This caption accompanied a picture of departing traffic. In the foreground, a temporary sign reads 'Evac Route. I-70 W'.
Allison Henry, right, and Terrell Williamson, top left, look back and laugh as Katherine Forehand falls down while wading through a floodwaters from Hurricane Isabel in front of Union Point Park in New Bern, N.C., Sept. 18, 2003. Allison Shivar and Andrew Player are pictured in back. They are camp counselors from camps Sea Gull and Seafarer that were evacuated after preparing the camp for Isabel. (CBS.com; Photo: AP) Etta Stewart, left, rides down a parking lot gutter full of rainwater in Cameron Village Shopping Center in Raleigh, N.C., as her friend Geri Hubbe watches, Sept. 18, 2003. The girls' school was closed due to Hurricane Isabel. (CBS.com; Photo: AP)	Risky Behaviour	The images accompanying these captions show people playing in waist-high flood water. The risk associated with severe weather appeals to some segments of beach area populations. The notion of a 'hurricane party' is well understood by most coastal residents, whether they identify with their thrill-seeking neighbours or not.

In reviewing transcripts, we identified stories about experiencing serious weather events and making judgments about weather-related risks. Through these individual narratives, residents situate their experience within a particular event context (e.g., Baynham 2003; Georgakopoulou 2003) and a community, and they connect personal experience to shared experience.

Some of the stories we identified are short, but contain at least the minimal elements we've described as necessary for narrative:

6.1 Remembering Storms Experienced

For some residents, previous experience shapes their current perceptions of storms and preparedness. In this narrative, a resident recounts a childhood experience to contrast the availability of information then with the availability of information now. The resident started the narrative earlier in the interview. The earlier start did not develop into a story, but here the teller connects the experience to the topic of information availability, which arose later in the interview:

> Because actually I was telling you this, the first hurricane I remember, Hazel, was in 1954/55 or something when it came through eastern North Carolina and I lived in Rocky Mount. Are you familiar with Rocky Mount, it's near Greenville? .... And it came through Rocky Mount and uh, we stood at the window and watched uh the trees fall over. I went to school that morning, and after I got to school it was ah, "you have to go home. You have to go home there's a hurricane coming." Nobody knew much about anything. Now of course you know days and days and days before.

The purpose of recounting the Hazel story is to contrast the way that the resident found out about a hurricane situation in a time before emergency management plans and the plethora of media such as The Weather Channel. The actions include going to school the day after the storm and then being dismissed immediately because, back then, 'nobody knew anything'. In other words, no one knew about the storm in time to close the schools because weather forecasting and media coverage were not what they are 'now', a time when we 'know days and days before' a storm makes landfall. Residents in our study who have been through any storms often communicated narratives around these experiences. Evidently, storm events are memorable in part because of their connection to specific times and places.

6.2 Staying

Many of the residents we interviewed have stayed home during serious hurricanes such as Isabel. The next narrative indicates some of the reasons people stay. The resident introduces the narrative with an event:

> Well, I rode out Isabel and when I saw the mini-blinds in my windows starting to swing out, and the windows are closed,.... and this is on the inside, I kind of had second thoughts about staying but by that time it was too late, uh, but a lot of individuals stay because they don't have anywhere else to go...uhhh, they don't want to get caught up in the traffic, uh, the storm is not going to be as bad as the news is presenting it, so there's a lot of reasons not to go.

The speaker signals concern over the situation with the detail, 'when I saw the mini-blinds in my windows starting to swing out and the windows were closed'. The next event happens in the storyteller's thoughts; he second-guesses the decision to stay, realizing that it's too late to leave. The narrative turns to the situation of other people who stay because they don't have anywhere else to go, deflecting from the narrator's own story. The narrator then rationalizes that the traffic out would be bad and the news made too much of the storm anyway. These complaints are consistent with other residents' attitudes.

6.3 Evacuating

The resident who told the following story evacuated for hurricane Isabel, but like many residents, experienced related problems. Two recurring problems are cost and arriving at a less safe destination.

> But I don't know if I would evacuate again. It was very expensive waiting in a motel and not being able to get back right away. I was gone five days and I have neighbours that stayed and of course you know, no but, they weren't, were not in a flood zone and they were fine. But it was, Isabel was, longer than most storms.

A question from the interviewer encourages her to complete the narrative:

> So they were without power longer. And even where we went it was hard to get back because of so much mainland devastation. I was lucky I went to Durham. People who went to Richmond were stuck. If they went the northern evacuation route.... they couldn't get back. And my friend who lives in Hatteras evacuated and she couldn't get back for a long time cause they wouldn't let people back on Hatteras Island and they wouldn't even let her into [County] to stay with me.

The resident comments on the expense and inconvenience of evacuating, power outages and 'devastation', and the difficulty of returning. These problems may influence her own and others' behaviour towards riskier choices in the future. The challenges to returning from an evacuation are perhaps inevitable. More relevant for perception study, such experiences become a factor in residents' future judgments of risk, particularly if a storm for which they evacuate does not cause the localized damaged that is forecast. One continuing problem for forecasters and emergency managers is that storm track and damage predictions cannot be made with absolute precision.

6.4 Risky Behaviour

Some storm stories tell about residents throwing caution to the wind. A number of these 'risky behaviour' stories include organizing hurricane parties, walking or swimming in flooded streets, or surfing in the high waves of pre-landfall storm surges. The next brief example depicts flouting safety advice to remain indoors as the calm central 'eye' of the hurricane passes through a locale followed by the return of dangerous winds.

> And here's something, that just about everybody who lives here knows this but nobody does it. Everybody runs out in the eye of the storm. You run out to check on your neighbours, you run out to kind of get out of the house for a while

> and say, shhhhooo, okay, we've gotten a little bit of a breather here. But I guess we don't often think, and we need to be reminded, that it doesn't take long, for that wind to come back. And uh, depending on where you are your health or life could be in danger and it's shame on me....(You've done that?) ... LAUGHING. Oh sure. (And what happened?). Oh nothing. I got back inside before the . . . . before the return of the storm....

The resident signals the narrative with 'And here's something', 'Everybody runs out in the eye of the storm'. The teller continues the narrative not in first person, but in second person, suggesting a kind of hypothetical 'you' in abstract reflection on storm experience. In this narrative, as in most, the resident also implicates community with references to 'everybody', 'the neighbours', and 'we'.

Here, as in other accounts, the storm event is central to the narrative and the time frame is very significant here. The duration of the action lasts as long as the eye of the storm passes over the area; usually, this occurs quickly, over a few minutes. The additional action in the narrative includes those activities that can happen outdoors during that window of opportunity, such as checking on neighbours. But reality sets in quickly in life and in stories and getting out of harm's way becomes the focus of the narrator's evaluation with the recognition that by staying too long outdoors 'health or life could be in danger'. The result proves thankfully anticlimactic, as the resident responds 'Oh nothing', to the interviewer's query about what happened when he ventured outside in the eye.

6.5 Evacuating and Sheltering

Some stories focus on evacuation and sheltering. One participant told a story about evacuating to a shelter while she was pregnant:

> Honestly, I don't prepare for it because I hope not to. But when the time comes yes we do get everything together and there is, make sure we have enough food and everything. That was the last mistake that was made. I was pregnant. In the shelters in high school for almost a whole week. Sleeping on the floor. No food. (Goodness. What storm was that?) Isabel. I was in Northside high school. They provided... It was very limited. (So you were there for a week?) Just about. (And there wasn't enough food?) They were serving food, but it was very limited. People weren't allowed to get seconds or anything. There were very small portions. (Were there a lot of people there?) Yes there were. We were sleeping in hallways, on the floor. And I couldn't sleep for those days, because my stomach was so big, my son was ten pounds at birth. I couldn't sleep on the floor. I had to try and stay up until I got home.

Again, this narrative points to problems - lack of food and adequate space - that could cause the speaker not to evacuate.

6.6 Re-Entry

In this narrative about re-entering the area after a storm, the resident's narrative is embedded in his evaluative talk about the hurricane guide. The signal for the narrative, 'during Hurricane Isabel they did not have...permits', occurs in a sentence that begins with an evaluative remark, 'I put a positive

right here…' This narrative depicts a confrontation between the participant as a returning resident and an emergency management official:

> uhhh, I put a positive right here in priority two, during Hurricane Isabel they did not have the one, two, three for the uhh permits. I use to run a large shopping center here and I was not able to [get to] that center. I mean I had to argue with the [city] chief of police that I had to go down there to find out do I still have a building here. Of course that building had grocery stores, the items that most people need to survive during a storm. I needed to make sure those were still intact. And how to fare for any damages. So I'm glad they finally did a priority two so …… (You were standing there arguing to get in?) Well, actually they did a set down basically. You can't travel down the road. But the roads were basically clear. I was told by the chief of police of [municipal] that I could not go down [inart] to find out if that stuff is still standing. And because of that, I mean, I had to argue for about an hour just to get seven miles down the road. Finally he let me go.

Emergency management personnel attempt to keep people out of damaged areas. However, during Isabel, many residents believed that they were unnecessarily blocked from getting to homes and businesses, as this narrative suggests. After Isabel, many stories similar to this one reached officials. Subsequently, the re-entry permitting process was changed so that owners and managers of businesses that provide basic supplies and services can enter prior to residents' re-entry.

The 'little stories' embedded in residents' analyses of the hurricane survival guide reflect each resident story-teller's perception of risk, sometimes include a didactic message, and often reinforce thematic narratives about characteristic responses to risks in the region.

7. Developing the Community Narrative

Residents' individual actions described in their narratives are often explicitly linked to cultural commonalities in 'hurricane alley', a name historically applied to the region of our study (Barnes 2001: 79). Analytically, we identify these commonalities as community narratives. Community narratives are constituted by recurring themes about risks of severe weather that we identified across a number of interviews as well as in the news media. These thematic narratives might be considered the common sense against which individuals measure their own perceptions and create counter narratives. Community narratives are evident in individuals' narratives in three ways: as shared opinions, shared prediction, or participation in typical action. Shared opinions inform individual evaluation of information as credible or not. In this evaluation, contrasts are thematic as, for example, unreliable national weather news media is contrasted with reliable local news media.

Another contrast underlies the evaluation of people as competent or not, as for example, the survival know-how of year-round residents is contrasted with the dangerous ignorance of tourists and seasonal workers. Shared prediction refers to collective intuition about hurricanes in relation to the region. For example, all the residents we interviewed expect that hurricanes and tropical storms of varying force will affect the region, if not tomorrow, then at some

point during one of the annual storm seasons. Expressed as individual judgment coupled with an understanding of community response, themes express commonly held beliefs that storms are inevitable yet unpredictable, news media attention is ubiquitous yet skewed, and the region's people are vulnerable yet resourceful.

Typical actions include judging storm conditions, making preparations, and either evacuating or staying. Each action invites the unknown in a different way. Staying might mean either well-prepared 'toughing it out' or participating in risky behaviour. Evacuating might mean arriving at a safer place or getting trapped in traffic. Individual residents' understanding of available actions is reflected in—or possibly instilled through—the media, which tells the same stories to many residents at once.

In our analysis, the community narratives reveal fundamental binary ideas about human needs or desires. The first binary is knowing/not knowing, in reference to met/unmet needs for useful information. The second binary is security/liberty, in reference to competing desires for safety and the freedom to do as one wishes (Stone 2002). These binaries inform the intellectual strategies by which residents resolve ambiguities and tradeoffs presented in public information about hurricanes. 'People don't just have needs, they also have ideas about their needs' (Walzer 1983: 65, quoted in Stone 2002: 88).

8. Conclusion

In the social and cultural space of a hazardous hurricane, a triad of actors--governmental emergency managers, public information professionals in government and news media, and residents--engage in risk communication. Each actor type contributes to, and is influenced by, a messy process of originating and using information. The best analogy for this process may be a three-way conversation attempted in a crowded, noisy room. Adequate theoretical models of risk perception will account for the complex influence of risk communication.

'Risk perception studies demonstrate what matters to people' (Renn 2008: 146). To learn what matters, we need to know how people get and use information. Risk information seeking and processing (RISP) theories (Griffin et al. 1999) suggest that people's information gathering activity, as well as the information itself, contributes to the ways that people structure experience and interpret risk. The preliminary analysis reported here suggests benefits of using combined methods to study how people think about risk. Narrative analysis focused on everyday story telling can show ordinary interpretive processes. Information usability testing by methods such as the 'plus/minus' document evaluation method can show evaluative processes. Combined approaches enable a wider view of the 'extent to which a person will seek out risk information in both routine and non-routine channels and the extent to which he or she will spend time and effort analyzing the risk information critically' (Griffin et al. 2004: 27).

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