

A Theoretically Guided Exploration of the Public's Hurricane Message Perceptions and Response Behaviors Julie L. Demuth¹, Rebecca E. Morss¹, Jeffrey K. Lazo¹, Heather Lazrus¹, Betty Morrow²

Motivation and Theoretical Background

- People's risk perceptions and protective responses to weather risks are influenced by several factors, including their individual characteristics and the messages they receive. Identifying and understanding relationships among these factors is important for improving weather risk communication.
- The Extended Parallel Process Model (EPPM) is a theory that explicitly examines people's perceptions and responses to risk messages (e.g., Witte 1994; Witte et al. 1996). Although the EPPM was developed to study public health risks, it offers great potential to help examine and develop more effective weather risk communication.
- Informed by the EPPM, here we examine the influence of hypothetical risk messages and respondents' individual characteristics on perceptions of and responses to hurricane risks.

Research Design

Survey Data Collection

- We surveyed Miami-Dade County, FL, members of public (n=261), targeting people in evacuation zones A and B—i.e., residents at risk from storm surge (Fig. 1).
- Knowledge Networks managed the mixedmode survey; participants were invited via postal mail and responded online.
- The survey was fielded Nov 2011–Jan 2012 in English and Spanish.



Survey Design

- Respondents were shown a hypothetical scenario of a hurricane approaching the Miami area and were randomly assigned to receive different risk messages (Fig. 2), including:
- 1. CONE the cone graphic, either with or without the center line
- 2. SURGEMSG either a message about storm surge or not (Fig. 2).



or longer."

Fig. 2. Two hypothetical hurricane messages

• Next, we gathered data on respondents' risk perceptions and perceptions of and responses to the messages. We also gathered data on respondents' individual characteristics.

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Fig. 1. Miami-Dade evacuation zones

1. CONE – Cone of uncertainty graphic, with or without the line 2. SURGEMSG – "This storm surge will be extremely violent, destructive, and deadly. If you live in an area at risk from storm surge and you stay in the area, you may die. Essential services such as food and water, electricity, transportation, communication, etc. may not be available for several weeks

Survey Measures

Risk perception (e.g., Slovic et al., 2004; Slovic, 2010)

- Cognitive perceived likelihood of a hazard and severity of impacts Affective – underlying "good" or "bad" feeling associated with a risk
- Negative affect: worry, fear, anxiety, dread, depression

Message perceptions and responses (e.g., Witte, 1994; Witte et al., 1996)

- Fear control emotional, defensive reaction to a risk
- Reactance: perception that risk message is "overblown" and "misleading"
- Defensive avoidance: not wanting to think or learn more about the risk
- Denial: refusal to believe or consider risk information
- Danger control cognitive, protective reaction to a risk
- Positive attitudes about the message usefulness and its role in spurring protective behaviors
- Evacuation intention

Individual characteristics

- Past hurricane experiences past evacuation, damage, emotional impact
- Socio-demographics age, gender, education, employment, race, ethnicity, primary language, residence length and ownership, household size
- Cultural worldviews (Smith & Leiserowitz, 2013) egalitarianism and individualism

Results – Effects of Messages



More negative affect (than cone with line)*

More fear control-reactance (than cone w/o line)**

Greater evacuation intent (than cone w/o line)*

- NO differences between the messages on:
- Cognitive risk perception
- Fear control: defensive avoidance or denial Danger control

More fear control-reactance (than no msg), specifically on perception that message is "overblown" ***

Greater evacuation intent (than no msg) ***

- NO differences between the messages on: • Risk perception: cognitive or affective • Fear control: defensive avoidance or denial Danger control

Results – Effects of Individual Characteristics

Cultural worldviews

Past hurricane experience

- Higher cognitive risk perception**
- Lower fear control denial*
- Greater negative affect*

* p<0.1, ** p<0.05, *** p<0.01 (statistical significance of parameter estimates from regression analyses)

Overall, the results suggest that: (a) people respond differently to different risk message elements, and (b) individual characteristics, such as worldviews and experience, differently influence people's risk perceptions and responses to weather risks.

Future work will be conducted to examine these influences in greater detail.

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Regression analyses – controlling for the risk messages received, sociodemographic characteristics, and past hurricane experiences – show a <u>consistent effect of individualism</u>. Individualists are associated with:

Lower risk perception – cognitive*** and negative affective**

Lower intention to evacuate*** and danger control***

Greater fear control – reactance***, defensive avoidance*, and denial***

Regression analyses – controlling for the risk messages received, sociodemographic characteristics, and cultural worldviews – show <u>differential</u> effects of different types of past hurricane experience.

Past hurricane evacuation experience is associated with:

Higher intention to evacuate*** and danger control***

Past property damage or loss due to a hurricane is associated with:

Lower fear control – reactance* and defensive avoidance*

Past emotional impacts / distress due to a hurricane is associated with:

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