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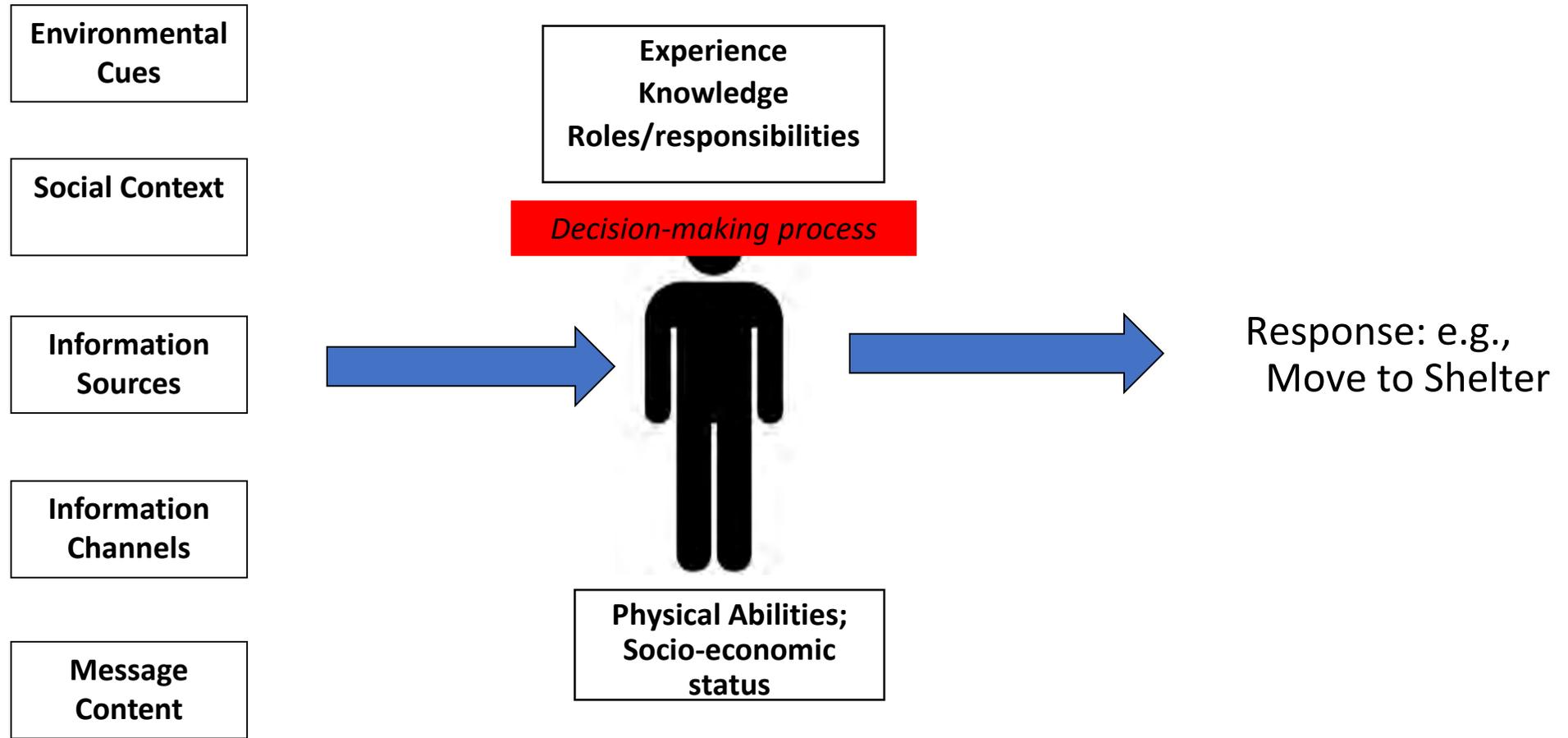
Communicating with the Public under Imminent Threat from Tornadoes

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Background

- A prevailing culture exists that is familiar with shelter-in-place (SIP) protective actions in tornado-prone regions
 - Emergency communications plans and guidance (incl. message templates) exist outlining strategies to prompt SIP behavior
- In recent years, public tornado shelters have been constructed and made available (pre-tornado) for public safety
 - This change requires public education programs on their use (since policies for their use differ from state-to-state or county-to-county)
 - Even with comprehensive education programs, people under imminent threat will still need to receive effective alerts/warnings messages before taking shelter
- This prompts the following questions:
 - How might we effectively communicate with the public (under imminent threat) to prompt safe and efficient public sheltering behavior?
 - How might we update our current evidence-based alerting/warning messages to account for public sheltering behavior?

Setting the Scene...



Mileti and Sorensen 1990; Lindell and Perry 2004

Social Science Research Findings to Consider (1)

Factor	Likelihood of Taking Protective Action
Negative past experience with 'the action'; or positive past experience with 'not taking the action'	<i>Lower</i>
Trusted source; Official order	Higher
Witnessing others taking action	Higher
Witnessing environmental cues	Higher
Preparation; Knowledge; Having a plan	Higher
Pets/livestock at home	<i>Lower</i>
Attachment to home/belongings	<i>Lower</i>
Perceiving a threat and personal risk; Confirmation of this threat/risk	Higher

Social Science Research Findings to Consider (2)

Factor	Likelihood of Taking Protective Action	Primary method to address
Negative past experience with 'the action'; or positive past experience with 'not taking the action'	<i>Lower</i>	Education
Trusted source; Official order	Higher	Alert/warning message
Witnessing others taking action	Higher	Alert/warning communication
Witnessing environmental cues	Higher	Alert/warning message
Preparation; Knowledge; Having a plan	Higher	Education
Pets/livestock at home	<i>Lower</i>	Shelter Policy
Attachment to home/belongings	<i>Lower</i>	Education/Shelter Policy
Perceiving a threat and personal risk; Confirmation of this threat/risk	Higher	Alert/warning message

Focus of this Presentation...Alert/Warning Messages

Factor	Likelihood of Taking Protective Action	Primary method to address
Negative past experience with 'the action'; or positive past experience with 'not taking the action'	<i>Lower</i>	Education
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Witnessing others taking action	Higher	Alert/warning communication
Witnessing environmental cues	Higher	Alert/warning message
Preparation; Knowledge; Having a plan	Higher	Education
Pets/livestock at home	<i>Lower</i>	Shelter Policy
Attachment to home/belongings	<i>Lower</i>	Education/Shelter Policy
Perceiving a threat and personal risk; Confirmation of this threat/risk	Higher	Alert/warning message

How to Increase Response via Effective Messaging (1)

- Source of message:
 - Messages provided by a trusted source are more effective at prompting action
 - **Guidance:** Who is the trusted source(s) in your community? There is no 1-size fits all
- Official Order to Shelter:
 - Issuing an official order to take shelter (in public locations) can be effective at stimulating protective action
 - **Guidance:** Disseminate official orders, when appropriate, via multiple communication channels
- Actions of Others:
 - Witnessing other people taking action can prompt receivers to take a similar action
 - **Suggestion:** Find ways to show message receivers that others are taking action; e.g., Live video footage (inside the shelter?) can show action being taken
- Environmental Cues:
 - Witnessing environmental cues can also motivate people to take action
 - **Guidance:** Relay to the public – DO NOT wait until you can see/hear/feel trees swaying and debris flying by – until you take action

How to Increase Response via Effective Messaging (2)

- **Risk perception:** Messages that evoke urgency are more effective in influencing safe and efficient response. Here's how:
 - Use of “more serious” or actions words within the message
 - Place the receiver “inside” the risk area via graphics, videos, etc.
 - Describe the consequences of the disaster, should they find themselves in the affected area
- **Confirmation of risk** – (or milling) is a common action for people who receive information about an impending disaster; however, it delays protective action!
 - *The more, the better!* Use **multiple** channels to disseminate **consistent**, accurate, specific, and clear information
 - Outdoor siren alerts should be accompanied by warning information to aid with confirmation



Elements of an Effective Alert/Warning Message (1)

1. Source of the message
2. Hazard threat and its impacts/consequences
3. Populations/geographical areas at risk
4. Time at which actions should be taken
5. Recommended protective actions

Elements of an Effective Alert/Warning Message (2)

Elements	Shelter-in-place (current action)
Message Source	Trusted: NOAA/NWS; Emergency Management Agency; First Responders
Hazard threat, consequences	“Tornado warning”; Describe the threat – Tornado reported on the ground! Consequences - Flying debris that can damage and destroy homes, injure people
Populations/geography at risk	Describe city/county names, highway mile markers, landmarks
Time to take action	Do not wait until you see; Go NOW!
Recommended protective actions	House: Go to your basement, safe room, or an interior room away from windows Outside: Seek shelter in a sturdy building In a vehicle: Drive to the closest shelter
Additional information	Feedback messages: If/how people are already taking action (show video)
Lead time (dissemination)	Current timing: ~10-15 mins
Dissemination approaches	Any/all channels

Elements of an Effective Alert/Warning Message (3)

1. Source of the message
2. Hazard threat and its impacts/consequences
3. Populations/geographical areas at risk
4. Time at which actions should be taken
5. Recommended protective actions

Example 1: (campus-wide audible messaging system): Alert tone precedes announcement.
“This is Joan Smith, Chief of Campus Police. A tornado has been spotted on the ground at [20th Street and Mockingbird Lane]. The tornado is strong and is moving toward the college campus at high speeds (with winds over 160 mph). High winds and large, flying debris can flatten a building in a storm of this magnitude. Take shelter now. Get inside NOW, go to the lowest level, and get away from windows. Stay there until further instructions.”

Reading level: 5.3

Example 1 taken from: Kuligowski and Omori, 2014. “Guidance Document: Emergency Communication Strategies for Buildings,” National Institute of Standards and Technology: Gaithersburg, MD.

Elements of an Effective Alert/Warning Message (3)

1. Source of the message
2. Hazard threat and its impacts/consequences
3. Populations/geographical areas at risk
4. Time at which actions should be taken
5. Recommended protective actions

Example 2: (Wireless Emergency Alert, 360 characters): Alert tone precedes message.
“OK City Office of Emergency Management. TORNADO WARNING. A strong tornado has been spotted on the ground at [Rte 44 E of the airport] and is approaching Wheeler Ferris Wheel and Bricktown. High winds and large, flying debris can flatten a building in this storm. Take shelter NOW. Go to the lowest level, stay away from windows. Wait for further instructions.”

Reading level: 5.7

Example 2 adapted from: Sutton and Kuligowski, 2019. “Alerts and Warnings on Short Messaging Channels: Guidance from an Expert Panel Process,” Natural Hazards Review (published online).

Differences in Messages by Protective Action

Elements	Shelter-in-place (current action)	Evacuate to public shelters (new)
Message Source	Trusted: NOAA/NWS; Emergency Management Agency; First Responders	(same) + <i>Shelter owner/operators</i>
Hazard threat, consequences	“Tornado warning”; Describe the threat – Tornado reported on the ground! Consequences - Flying debris that can damage and destroy homes, injure people	(same)
Populations/geography at risk	Describe city/county names, highway mile markers, landmarks	OR, <i>school districts; public shelter catchment areas (similar to hurricane evac zones)</i>
Time to take action	Do not wait until you see; Go NOW!	(same)
Recommended protective actions	House: Go to your basement, safe room, or an interior room away from windows Outside: Seek shelter in a sturdy building In a vehicle: Drive to the closest shelter	<i>CLEAR CRITERIA</i> on how to decide to SIP or go to a public shelter: E.g., Do you have access to a basement? Stay there. If not...Travel to your closest designated community shelter
Additional information	Feedback messages: If/how people are already taking action (show video)	(same) + <i>Shelters available/open, locations, routes, travel time, restrictions/amenities</i>
Lead time (dissemination)	Current timing: ~10-15 mins	<i>Community-dependent</i>
Dissemination approaches	Any/all channels	(same)

Shelter Communication Challenges/Questions

- What *sources* could provide the required types of information – but still remain consistent in the overall message?
- What is the *clear criteria* that can facilitate the public’s decision-making about shelter usage? Instructions should be clear and consistent.
- What is the list of “*additional*” *information* that must be provided to people who may use public shelters? What is the best way to communicate this information?
- Which populations might be unaware of shelter location/policies (e.g., tourists)? How do we communicate shelter information/instructions to individuals (*under imminent threat*) who haven’t been exposed to tornado shelter education?
- How early should these alerting/warning messages be provided (*lead time*)? Can messages be provided early enough such that people process the information and act in time?
- How can short message *channels* (with restricted characters) be used and still provide all necessary information?

Thank you!

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