



Societal Impacts and Public Perception

Advanced Warning Operations Course
IC Core 5

Lesson 1: The Warning Response Process



Warning Decision Training Branch

Welcome to the Societal Impacts and Public Perception portion of the Advanced Warning Operations Course. This instructional component focuses on the impacts of hazardous weather warnings on society. This section does not cover the impacts of weather on society, only the warnings. Lesson 1 addresses the social-psychological process that people go through from the time a first warning is heard to the time people respond – The Warning Response Process.

Overview of Societal Impacts and Public Perception

- **Lesson 1: The Warning Response Process**
- Lesson 2: Effective Warnings
- Lesson 3: Social Science Lessons: What We Have Learned From Recent Floods and Warnings
 - Presenter – Eve Gruntfest

There are only three lessons in IC Core 5 Societal Impacts and Public Perception. Each lesson is an online “recorded” session of 20 to 45 minutes in length. After listening to the three modules, take the short 10 question quiz to receive credit for this instructional component.

What response do you want?

- May 3, 1999 – Man crawls into sewer.
- May 4-10, 2003 – Missouri Emergency Management “*There were no surprises.*”
- Is success in a warning event defined by FAR, POD, and Lead Time?



What are some of things a warning forecaster can do to get the desired response from the public? A man in the path of an F5 tornado actually crawled into a sewer to escape injury. Emergency managers were able to move road crews out of the way of an F4 tornado. What did NWS forecasters do to elicit these responses? FAR, POD, and Lead Time only partially measure the success of a warning event.

Overview

- What is the social-psychological process that people go through from the time a first warning is heard to the time people respond?

“A long way to go before we completely understand the relationship between warnings and behavioral response.”

- Dr. Eve Grunfest

Professor Geography and Environmental Studies
University of Colorado, Colorado Springs

Although there is not a lot of research linking warnings and behavioral response, much of the research that does exist shows that there is a process that takes place between hearing the warning and reacting. The sender of the warning message can impact the actions of the receiver of that warning message. Therefore, it is important for forecasters that issue warnings to understand the process the public generally goes through prior to responding to the warning message.

Learning Objective

1. Identify the common process between a person hearing the initial warning and responding.

There is only one objective to this lesson.

The Warning Response Process

- Hearing
- Understanding
- Believing
- Personalizing
- Confirming
- Deciding and responding



People don't just hear a warning and take action. There is a process that takes place between hearing the warning and reacting. That process can take only a few seconds or several minutes.

People go through a more or less sequential process in which they consider various aspects of the decision confronting them before acting. The sequence may not be the same for every person, and each stage is not necessary for a response to occur.

Importantly, the behavioral outcomes of the public are impacted by both the sender (issuing the warning) and receiver (those hearing the warning) factors.

The Warning Response Process

- Hearing

- Most people get warnings via TV
 - Interpretation (or misinterpretation?)
 - Presentation
- Time of day
 - Less likely to hear at 3AM
- Community preparedness
 - Sirens
 - Alert System



It can't be assumed that just because a warning is broadcast that people will hear it. Most people receive NWS warnings over TV. NWS Forecasters must partner closely with the local media to ensure the warnings are transmitted accurately and in a timely fashion. NWS Directive 10-1801 specifically addresses this aspect; "NWS offices should conduct training sessions for hazards community members so they know how to use our services and how to integrate them into their decision processes." The directive further directs the NWS to encourage the media to participate in drills to test all aspects of the integrated warning system.

The Warning Response Process

- Understanding
 - Preparation
 - Climatology of event
 - Demographics
 - Older
 - More mobile
 - More diverse
 - More Spanish speaking

“... the value of being able to write warnings that are most meaningful to various segments of populations is also a growing need with tremendous benefit possibilities.”

- Dr. Eve Grunfest
Professor Geography and
Environmental Studies
University of Colorado, Colorado
Springs

After hearing the warning, the listener must understand the warning. The capabilities of the public to understand the warning has a lot to do with preparation. It is not just the duty of the Warning Coordination Meteorologist to educate and prepare the public. The entire NWS organization needs to help.

The public understanding is also impacted by the climatology of the event. For instance, the public's understanding of a severe thunderstorm warning is better in areas where severe thunderstorms are more common.

Demographics play into understanding. In 2000, one in eight Americans was over 65. By 2030 one in five Americans will be 65 or older. The increasing Spanish speaking populace especially in the South Central and Southwestern U.S. also is an issue in the public's understanding of a warning.

The Warning Response Process

- Believing

- Shift away from belief in “official” warnings
- Public weighs several factors prior to deciding whether to react
 - Perceived susceptibility
 - Appraised severity of threat
 - Belief in positive outcome from response



Does the “cry wolf” syndrome have a major impact on believability?

The warning may be heard and understood, but is it believed? Recent findings show that public reliance on “official” warnings from traditional sources may be shifting to more private and informal sources. (Baker 1995; Dow and Cutter, 1998; Drabek, 2001). People use new, previously unavailable sources of information and weigh several factors in their decisions about whether, how, and when to react to hazardous conditions.

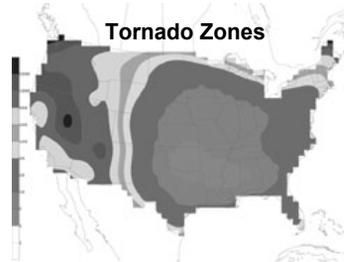
The classic referenced case is the “cry wolf” syndrome. Limited studies have shown that a previous false alarm is not a common factor on the believability of a warning.

Believability is influenced by many factors associated with the method and contents of the warning. Much of this presentation will focus on how the warning forecaster can influence believability.

The Warning Response Process

- Personalizing

- Level of community interaction
- Family composition
- Length of residency
- Emergency risk perception
 - Prior experience
 - Perceived proximity
 - Observation



People think of warnings in personal terms—what are the risks for themselves and family? The perception of risk is an important step in responding to a warning. If they feel “it can’t happen to me” they may well ignore a warning. The ability of the public to personalize the threat is to some degree set prior to the warning event. If an area has recently been hit by severe weather, the public will be much more likely to personalize the threat than people in an area that has not been threatened for several years.

The Warning Response Process

- Confirming

- Response is a consequence of a series of decisions
- Most actively seek out additional information
 - Call friends and relatives
 - Go outside and observe
 - Change TV channels



“When warning information is received, most people try to verify what they heard by seeking out information in another warning message or from another warning source or person.”

-Dr Dennis Mileti

Senior Research Scientist Natural Hazards Research and Applications Information Center

People are information hungry following the receipt of warnings. This can mean turning the TV to another station, checking with a neighbor, friend or family member, or going outside to look at the sky.

There is a need for a continuous flow of information. Even statements that repeat previously available information can help confirm the threat. That confirmation helps people better understand warnings, believe them, personalize the risk, and make response decisions.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
- Believing
- Personalizing
- Confirming
- Deciding and responding



Here is a recent example of a warning response process lifted from the pages of the July 19, 2004 NWS Focus. Understanding the behavioral aspects of the warning response process can help shape better warnings leading to a better outcome. In this case, an F4 tornado wrecked a manufacturing plant in Roanoke, IL, July 13, 2004, but a timely warning, a NOAA Weather Radio receiver, a prepared workforce, and reinforced shelters kept as many as 140 plant workers from harm.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
 - NWR receipt of a Severe Thunderstorm Warning 12 minutes prior to the tornado



In this case, the hearing aspect was from NOAA Weather Radio. This is not typical. Studies have shown that less than 5 percent of the population receive warnings from NOAA Weather Radio with most receiving warnings from TV and Radio. Most of the nation's workforce do not have access to TV and Radio at work. The local office led by the WCM can target workplaces to educate management at those sites of the cost benefit of a weather radio.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
 - Implements company severe weather plan
 - Activates employee spotters



Experience and training made understanding of the warning nearly instantaneous at the Parsons Manufacturing Plant. A severe thunderstorm warning activated the company's severe weather plan. Note that the plan did not send the employees immediately to shelter, rather activated designated employee spotters to seek confirmation of the threat.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
- Believing
 - Employees sent to designated shelters
 - Tornado Warning
 - Seven minutes prior to the tornado.



In this case, the employee spotters concluded it was time to take shelter within seconds of the time the Tornado Warning was issued. Note that the Tornado Warning was issued only 5 minutes after the Severe Thunderstorm Warning. This confirmation by both the employee spotters and the NWS warning forecaster led the employees to believe the threat was real.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
- Believing
- Personalizing
 - Strong safety plan
 - Monthly meetings
 - Tornado drills at least twice a year



The manager of the Parsons Manufacturing Plant had previously witnessed a tornado first hand. This personal experience resulted in the development of a strong safety plan, monthly meetings, and tornado drills at least twice a year.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
- Believing
- Personalizing
- Confirming
 - Cars blown from parking lot into side of building
 - Steel beams weighing up to a ton were “pulled into the vortex like match sticks.”



The combination of the employee spotters believing the threat, and the simultaneous receipt of the tornado warning was enough to send all employees to the designated shelters. For the employees in this case, the confirmation came when the tornado hit the plant.

The Warning Response Process – Case Study

Tornado Strikes Parsons Manufacturing Plant July 13, 2004

- Hearing
- Understanding
- Believing
- Personalizing
- Confirming
- Deciding and responding
 - “Looking at the pictures of the nearly demolished plant, a person wouldn’t think it possible that more than 120 employees got through that storm with no injuries.”
 - Mike Looney, Chief NWS Central Region Services Division



The decision to seek shelter (or crawl into a sewer) is not made upon hearing a warning. Studies have shown that a warning must be understood, believed, personalized, and confirmed before a decision is made to respond.

Response Item

You're at home watching the evening news, and you are surprised to hear your county/parish is under a Tornado Warning. What action do you take?

- A. Seek shelter immediately
- B. Tell the family to seek shelter while you go outside and look
- C. Grab the camera, and jump in the car to chase
- D. Call up some radar data on the internet
- E. None of the above

OK now...tell the truth. If you answered A (seek shelter no ifs, ands, or buts) then congratulations you are enlightened. You are also in a minority of the population.

Summary

The Warning Response Process

- Hearing
- Understanding
- Believing
- Personalizing
- Confirming
- Deciding and responding



In summary, a warning forecaster's understanding of the behavioral warning response process can result in a positive response by the public.

References

- The Role of Effective Communications in the Warning Process
 - Richard Smith, WDM III Workshop Presentation
- Communication of Emergency Public Warnings: A Social Science Perspective and State of the Art Assessment
 - Mileti and Sorensen, Aug 1990

References

- Toward Improved Understanding of Warnings for Short Fuse Weather Events
 - Eve Grunfest, March 2002
- Factors Related to Flood Warning Response
 - Denis S. Mileti, Nov 1996

End of Lesson 1



**Questions about Lesson 1:
The Warning Response Process
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You have completed Lesson 1 of AWOC IC Core 5. There are two more lessons in IC Core 5. If you have any questions about this lesson: 1) first ask your SOO 2) if you need additional help send an e-mail to iccore5@wdtb.noaa.gov (answers will be cc:'d to the SOO and considered for the FAQ page.) The test should be taken as soon as possible after completing IC Core 3 Lessons 1, 2, and 3.

