

Designing for Disaster: Warning Messages that Make a Difference

Jeannette Sutton, PhD

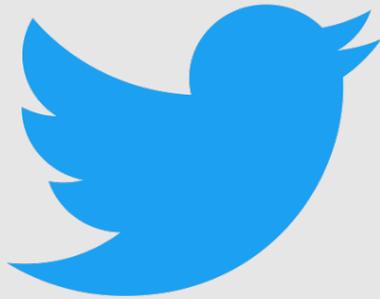
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Goal of a warning message

How do we get from this...



To this?



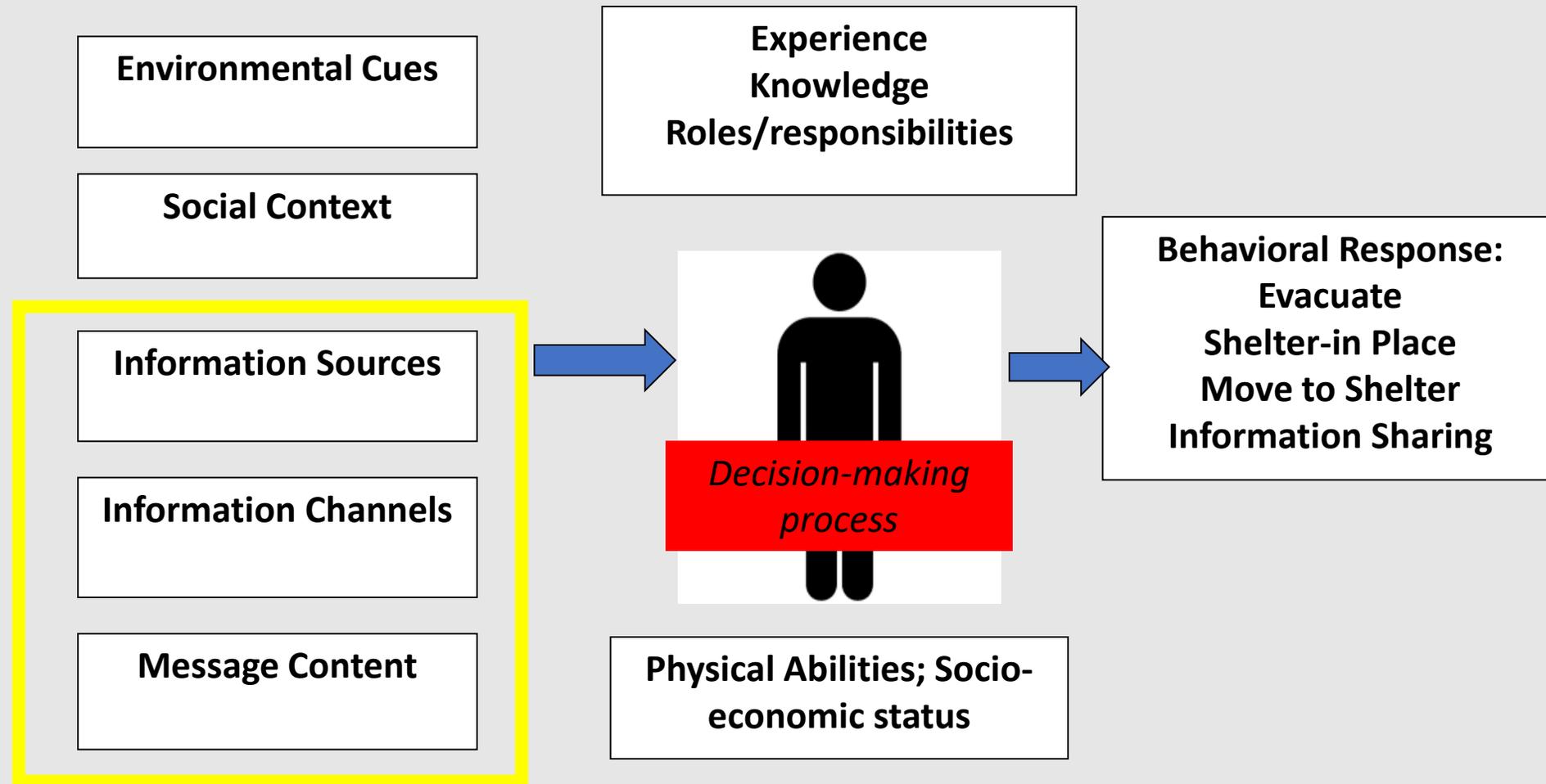


Start from theory about human behavior in disaster.

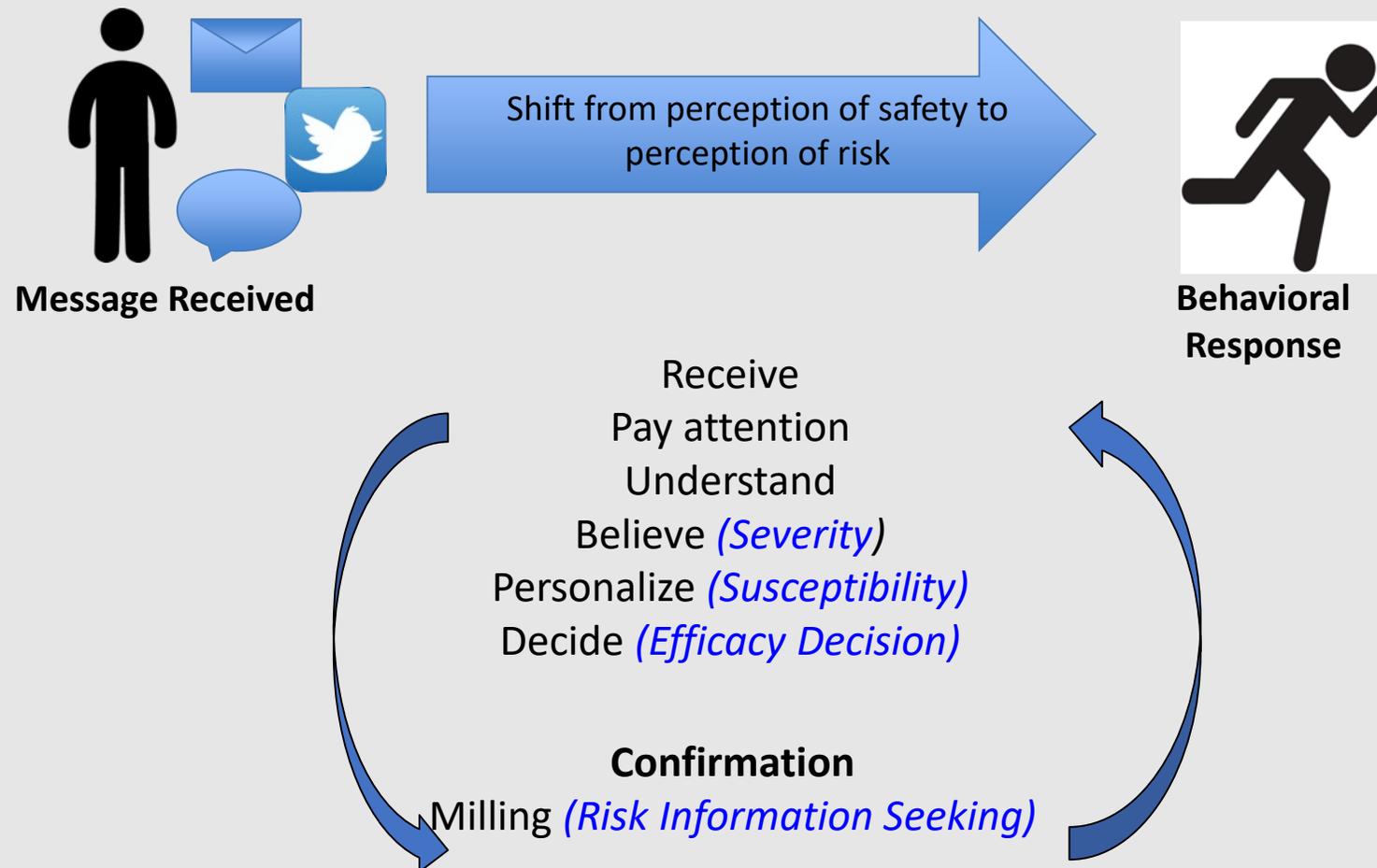
Protective Action Decision Model

Warning Response Model

Protective Action Decision Model



Warning-Response Model



Message Content that Matters



Hazard

Risk information about: What it is, what are the consequences, its severity



Time

To complete action; to get an update



Guidance

Efficacy information: What to do; how; why



Source

Credibility and context



Location

Risk information about: Population that is susceptible

Do these messages meet the standards?



**HOMELAND SECURITY
ADVISORY SYSTEM**

SEVERE
SEVERE RISK OF
TERRORIST ATTACKS

HIGH
HIGH RISK OF
TERRORIST ATTACKS

ELEVATED
SIGNIFICANT RISK OF
TERRORIST ATTACKS

GUARDED
GENERAL RISK OF
TERRORIST ATTACKS

LOW
LOW RISK OF
TERRORIST ATTACKS



NWS Albany @NWSAlbany

Severe Thunderstorm Warning continues for
Mechanicville NY, Hoosick Falls NY, Cambridge NY until
8:15 PM EDT

Severe Thunderstorm Warning

Valid Until
8:15 PM EDT Monday
September 23, 2019

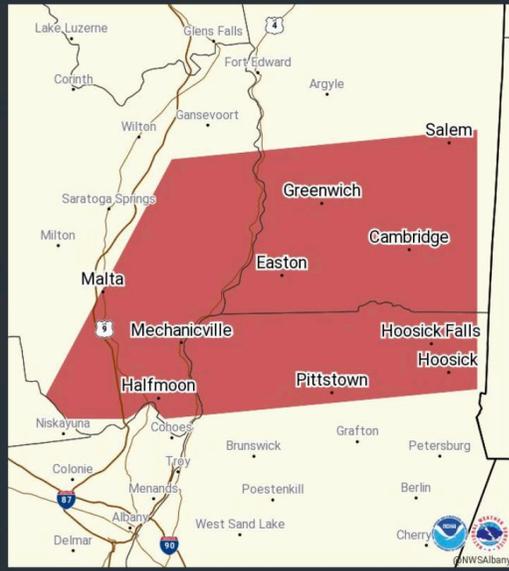
Threat Information

WIND
Up to
60 MPH

HAIL
Penny
Sized Possible

Potential Exposure

Population: 114,666
Schools: 32
Hospitals: 0



I just sent it, thanks
Andrew

CMAS Alert

Civil Emergency in this area until
1:24 PM EST Take Shelter Now
U.S. Govern

Dismiss

Thanks

Q W E R T Y U I O P

A S D F G H J K L

Z X C V B N M



Messages are getting longer...

Tweets are no longer 140 characters (now 280)

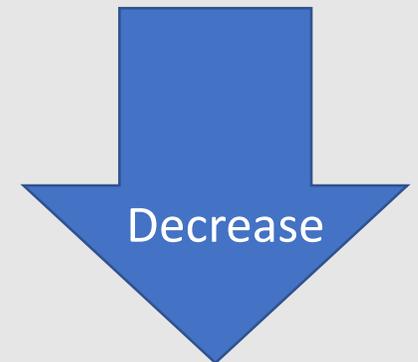
WEAs are no longer limited to 90 characters (now 360)

What can be done to improve behavioral response to short messages?



Understanding
Believing
Personalizing
Deciding

Information
seeking



*Information seeking
delays action.*

Natural Hazards Review / Volume 20 Issue 2 - May 2019

Technical Papers

Downloaded 178 times

Alerts and Warnings on Short Messaging Channels: Guidance from an Expert Panel Process

[Jeannette Sutton](#), Ph.D.; and [Erica D. Kuligowski](#), Ph.D.



We can improve message design by drawing from research

Design matters: it can affect message attention

Contents matter: they affect message perceptions and behavioral intent

Message design that affects Attention/Saliency

Include images

To capture reader attention (in addition to text)

Images may promote perception of risk; increase understanding of threat and protective actions; increase awareness of location

The use of color:

To identify ordinal levels of risk (green, yellow, red)

Red is perceived as having the highest risk

The use of text style:

ALL CAPS (to 'yell' at message readers)

Different fonts

The inclusion of icons/symbols

Can be cues to action; require interpretation from message receiver

Message Content that Affects Understanding

Avoid abbreviations and acronyms:

US DHS, CDC, CAL OES, USFS, or PDT/MDT

Clearly identify the threat:

what is the threat?

what is the potential impact?

Provide specific information about populations at risk/ locations of impact:

Avoid broad, nonspecific geographic areas, e.g., “Denver,”

“Washington DC”, or “this area”

Not all message receivers will understand the dissemination methods of the technology

Maps accompany clearly stated location information:

should be clear, readable, and understandable to the population at risk

Message Content that Affects Believing

Send messages from *a known and trusted source*.

Clearly identify the source name:
avoid abbreviations or acronyms if possible

Send imminent threat messages sparingly:
use WEA under conditions that warrant immediate population knowledge and action.

Ensure messages accurately reflect:
The seriousness of the event
The time of the event

Message Content that Affects Personalizing

Clearly indicate the seriousness of the event

Imminent danger, immediate evacuation, urgent, critical, and now

Action words indicate the need to take protective action

Go, run, take cover

Use unambiguous action words and phrases:

For example: use “close all doors and windows” in place of “shelter in place”. Or “leave the coast immediately” in place of “evacuate”

Include specific and detailed location information:

local, familiar landmarks that are easily identifiable

Message Content that Affects Deciding and Milling

Messages that are clear, specific, and certain.

Messages that are complete, unambiguous, and give specific actionable instruction



Reduce time spent looking for more information to:

- confirm threat
- actions to take
- actions being taken by others.



Well Designed Messages

360-character WEA



Can you identify:

Design features

Source

Hazard

Location

Protective Action

Time

What is missing?

What can be improved?

280-character Tweet

Can you identify:

Design features

Source

Hazard

Location

Protective Action

Time

What is missing?

What can be improved?



NWS Houston
@NWSHouston

Significant Weather Advisory: Line Of Strong Thunderstorms Continues To March Eastward.

nwschat.weather.gov/p.php?pid=2020... #txwx #houwx #bcswx

The graphic features a yellow header with the NOAA logo on the left and the NWS Houston logo on the right. Below the header, the text reads "Valid Until 11:00 PM CST Friday January 10, 2020". Under "Threat Information", there are icons for wind and lightning, with text: "WIND In excess of 40 MPH" and "Strong thunderstorms". Under "Safety Information", there is an information icon and text: "Secure light weight objects When thunder roars, go indoors". The main part of the graphic is a map of the Houston area with a yellow shaded region indicating the advisory area. The map includes labels for various locations such as Bryan, College Station, Caldwell, Snook, Navasota, Montgomery, Brenham, Hempstead, Waller, Bellville, Katy, Sealy, Brookshire, Columbus, Eagle Lake, Fulshear, Rosenberg, Needville, Wharton, and El Campo. A smaller inset map in the bottom left corner shows the advisory area in a broader regional context. At the bottom, it says "weather.gov/hgx", "Issued at: 1019 PM CST Fri Jan 10 2020", and "@NWSHouston".



280-character tweet



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280-character tweet



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280-character tweet



NWS Miami
@NWSMiami

Jan 21 - This isn't something we usually forecast, but don't be surprised if you see Iguanas falling from the trees tonight as lows drop into the 30s and 40s. Brrrr! #flwx #miami

Tuesday, January 21, 2020



Falling Iguanas Possible Tonight

Iguanas are cold blooded. They slow down or become immobile when temps drop into the 40s. They may fall from trees, but they are not dead.

South Florida Low Temps Tonight:

Metro Miami/Fort Lauderdale: low to mid 40s

Palm Beach Metro: around 40

Interior/Gulf Coast: 30s

National Weather Service | Miami



1:42 PM · Jan 21, 2020 · Twitter Web App

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280-character tweet



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What can be improved?

A few suggestions for honing your craft...

- Identify your threats
- Develop message templates for each threat (potential impacts, likely severity, and protective actions)
- *Practice* writing under limited time conditions
- Watch twitter to see if you can identify good messages

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For more warning message resources, go to my website:

www.Jeannettesutton.com

