

# **Public Preparedness and Response: The Role of Risk Perception, Efficacy and Inoculating Risk Communication**

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**OHSU/PSU Fall Symposium**

**November 30 2018**

“This material is based upon work supported by the U.S. Department of Homeland Security under Grant Award 2017-ST-061-QA0001. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security.”

# Events Carry a Risk Signature and Invite Threat Appraisal

- What does this event portend for the future?
  - *Risk Signal*
- How will we cope with this type of event?
  - *Efficacy*







## Boston Marathon (2013)





The Des Moines Register

University of Iowa  
3:40pm  
November 1 1991

November 1 marks the 25th anniversary  
of the Gang Lu shootings on the  
University of Iowa campus.

Timeline of Gang Lu shootings on University of Iowa  
campus

# The AURORA Room

dedicated to  
the memory of

Christoph K. Goertz

Dwight H. Nicholson

Robert A. Smith

Shan

**A plaque now hangs outside Nicholson's office in memory of Nicholson, Goertz, Smith and Shan.**









## Indian Ocean (2004)











**Hurricane Sandy:  
NYC-FDR  
(2012)**





**“Camp Fire”**

**Northern  
California  
(2018)**







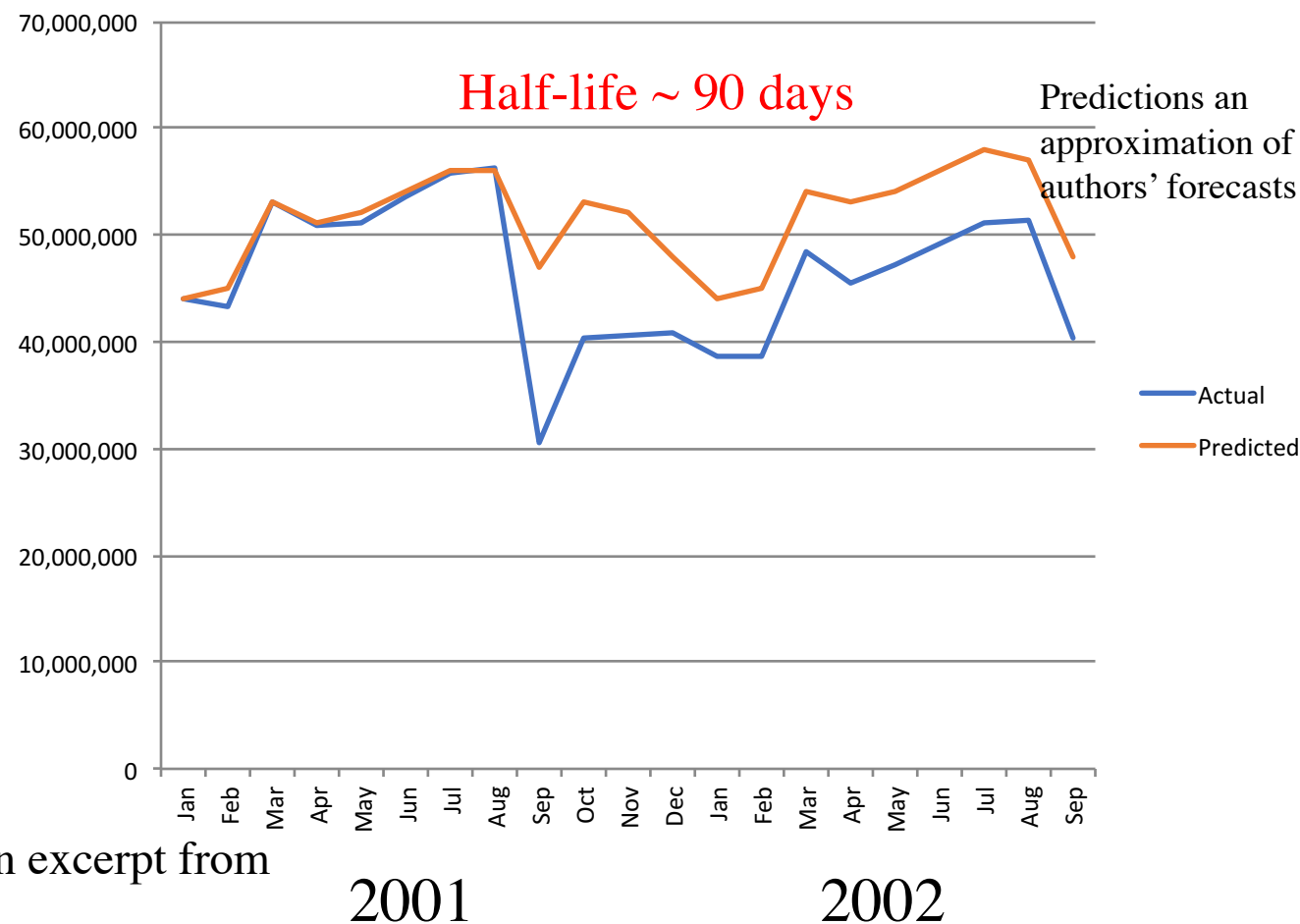
# How Quickly Do We Recover?

## The Economic Impacts of a Terrorist Attack on the U.S. Commercial Aviation System<sup>1</sup>

Peter Gordon, James E. Moore, II, Ji Young Park and Harry W. Richardson (2007)

9/11

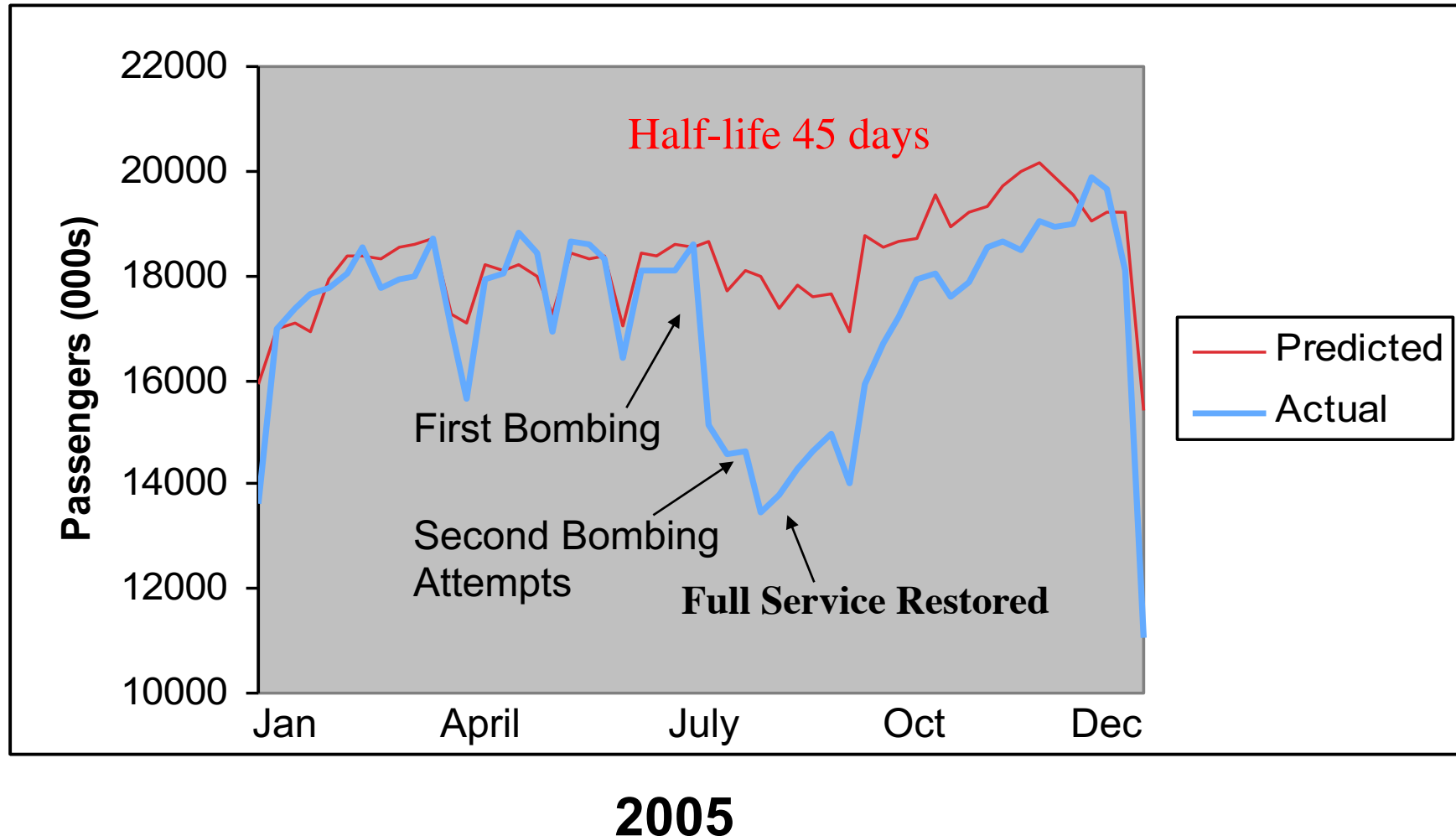
Passenger  
Miles  
(domestic)



<sup>1</sup>Graph based on excerpt from authors' data

## London Train Bombings: Predicted vs. Actual Passengers

(Prager, Asay, Lee & von Winterfeldt, 2011)







# Japanese Triple Crisis: Emotional Response in the U.S.

2011

(Burns, Reilly & Slovic, 2011)

Moderate to Very High



Scale:  
Very low-Very high

Disaster	Date	Sadness	Fear	Anger
Earthquake Tsunami	March 15, 2011	57%	19%	8%
	April 22, 2011	40%	10%	5%
Nuclear Disaster	March 15, 2011	50%	26%	14%
	April 22, 2011	37%	13%	13%



# Feelings About the Boston Marathon Attack 2013

Scale:  
Very low–Very high

%	4/16	4/30
<b>Sadness</b> (Very High)	56.9	38.8
<b>Anger</b> (Very High)	54.5	35.2
<b>Worry</b> (Very High)	20.0	10.2
<b>Fear</b> (Very High)	17.2	7.9



# Risk Signal: Perceptions of Risk to Future Quality of Life

How great is the risk posed to your future quality of life and that of your family from each of the following?

Scale: 7pt.

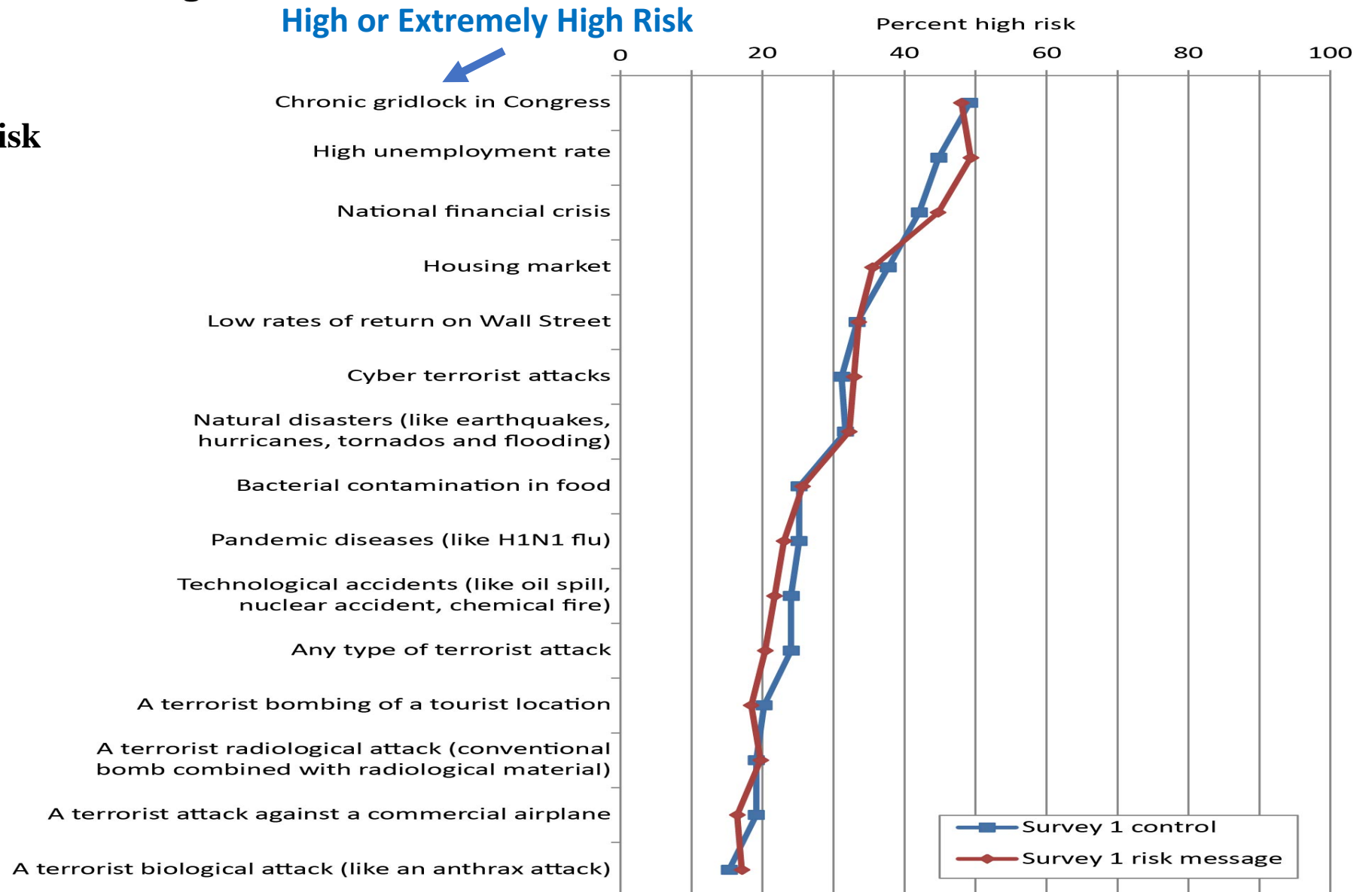
Range: 15%-50%

No risk-Extremely high risk

Survey 1

2013

N=335







# Taking Protective Action: What Do We Know?

- **Protective Action** =  $f(\text{Perceived Threat, Perceived Coping Skills})^a$ 
  - Perceived Threat =  $f(\text{Probabilities, Consequences})$
  - Perceived Coping =  $f(\text{Self-Efficacy, Response Efficacy})$
- **Assessing Threat and Ability to Cope** =  $f(\text{Attention, Learning})$ 
  - Attention Limited Resource<sup>b</sup>
  - Attention Gateway to Learning about Risk and Acquiring Skills
- **Social Networks: Critical to Diffusion of Information and Behavioral Reinforcement**
  - How Are are Communities Socially Networked?<sup>c</sup>

a: Bandura (1997); Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, (1986); Lazarus, (1999); Rogers, (1975)

b: Plass, Moreno & Brunken (2010)

c: Centola, (2018)



# Taking Protective Action: Motivation (M)

*Each variable normatively scaled 0-1*  
*“back-of-the envelope model”*

$$M = (\text{Probabilities} * \text{Consequences}) * (\text{Self Efficacy} * \text{Response Efficacy}) * (1 - \text{Effort})$$

  
**Perceived Risk**

  
**Perceived Coping**

  
**Perceived Cost**

## Think about Risk Events:

People perceive to be low probability but high consequences

People have little confidence that they can mitigate the risk

People feel the effort or cost of mitigation are more than they can do



# How Do We Go Wrong?

- **Planning:** Adopting Short Time Horizons<sup>a</sup>
- **Information Search:** Seeking Confirmation of Our Beliefs<sup>a</sup>
- **Probability Estimation:** Using Easily Remembered Outcomes<sup>a</sup>
- **Assessing Consequences:** Not discussing risk/benefit tradeoffs<sup>a</sup>
- **Cumulative Risk:** Focusing on Small Probabilities in Moment<sup>a</sup>
- **Underestimating Efficacy:** Allowing “Drop in the Bucket” and Non-relevant Emotions to Influence Our Motivation to Act<sup>b</sup>

a: Meyer & Kunreuther, (2017)

b: Small, Lowenstein & Slovic (2007); Vastjfall, Slovic & Mayorga, (2015)



# Perceived Inefficacy: “Drop in the Bucket”

## Donating money to save statistical and identified lives

### • Statistical Lives

- Food shortages in Malawi are affecting more than 3 million children
- In Zambia, severe rainfall deficits have resulted in a 42 percent drop in maize production from 2000. As a result, an estimated 3 million Zambians face hunger

Donations to Rokia drop by more than 40% when the statistics are presented.

### Identifiable Lives

Any money that you donate will go to Rokia, a 7-year-old girl from Mali, Africa. Rokia is desperately poor, and faces a threat of severe hunger or even starvation.



Her life will be changed for the better as a result of your financial gift. With your support, and the support of other caring sponsors, Save the Children will work with Rokia's family and other members of the community to help feed her, provide her with education, as well as basic medical care and hygiene education.

Source: Small, Loewenstein, & Slovic (2007)



Nelson

# Perceived Inefficacy: Infiltration of Non-relevant Negative Affect (Vastjfall, Slovic & Mayorga, 2015)

How much would you be willing to donate to help Nelson?

How good would you feel about helping Nelson (warm glow)?

You can help



Nelson

Children for whom aid may not be available



Sueva

Moussa

Mutaka

Jallo

Maluf

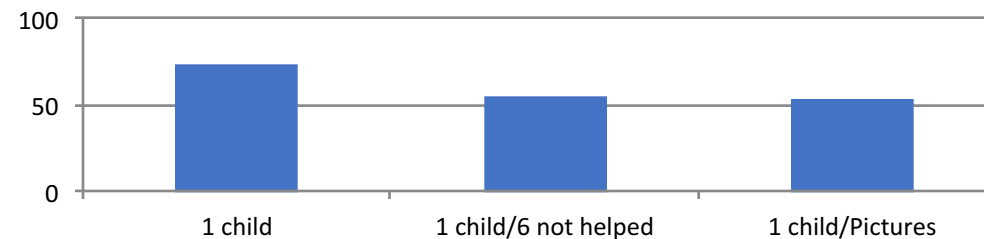
Okeke



Nelson



Mean warm-glow ratings in the picture study





For an excellent discussion of *cognitive biases* and how they prevent us from preparing for disasters please see:

***The Ostrich Paradox: Why We Underprepare for Disasters*** by Robert Meyer and Howard Kunreuther (2017).<sup>a</sup>

See especially their chapter on behavioral risk audits.

a: Robert Meyer & Howard Kunreuther (2017). *The Ostrich Paradox: Why We Underprepare for Disasters*, Wharton Digital Press: Philadelphia, PA.



# Pre-Crisis Risk Communication: Inoculation and Terrorism



# Inoculation Theory: Conferring Resistance to Persuasion

- **Goal: Increase Resistance to Attitudinal or Behavioral Changes<sup>a,b</sup>.**
- **As a Pre-Crisis Risk Communication Strategy<sup>c,d</sup>**
  - **Expose** individuals' to a weakened form of the challenges to their attitude or behaviors they might face by media, special interest groups and cognitive biases.
  - Propose **counter arguments** and possible **proactive behaviors**
- **Examples Messaging Alerts:**
  - **Terrorism:** Distortions in media, intent of terrorists to spread fear
  - **Natural Disasters:** Cognitive biases, preparedness behaviors
  - **"Fake News":** Prevalence and impact of false, detection behaviors





## Longitudinal Study Investigating the Impact of a Pre-Crisis Risk Communication Message

- **To what extent can a risk message, guided by inoculation theory and delivered prior to a terrorist attack impact the following?**
  - **Confidence** in Department of Homeland Security (DHS) After an Attack
  - **Economic Impact** After an Attack

**Note:** *The Transportation Security Administration (TSA) sponsored this study 2012-2013*



## A Risk Communication Experiment

### Nationwide Panel Tracked for 6 months

Inoculation →

Hypothetical  
Attack →

Real Attack →

Survey 1	Baseline measures of perceived risk, emotion and confidence in DHS.	Day 0
Survey 2	Randomly assigned to view four minute risk message video or not. Questions	Day 6
Survey 3	All respondents view a 1 minute video of simulated newscast of an attack on an aircraft. Questions	Day 10
Survey 4	Follow up survey questions (recovery)	Day 22
Survey 5	Follow up survey questions (recovery) <i>followed by three new attack scenarios (checkpoint, bus, train).</i>	Day 45
Survey 6	<i>Follow up survey questions (recovery) followed by questions about the Boston marathon attack.</i>	Day 77
Survey 7	Follow up questions (recovery)	Day 91
Survey 8	Follow up questions (recovery)	Day 170



# Video Risk Communication Message: Interview with Three Risk Experts

*Viewed at start of Survey 2 six days into experiment*

- Three risk experts from USC were video interviewed by professional actor about terrorism risk on airlines-4 *minutes*
- *Preparedness will be questioned (e.g. media)* ← **Exposure to possible media claims**
- *Mistakes have been made* ← **Counterarguments**
- *Capabilities have been improved* ← **Counterarguments**
- *Think and talk reasonably about terrorism risk* ← **Call to Action**





# Still Shot of One of the Risk Experts Interviewed

**DR DECISION RESEARCH**

Questionnaire  
Phase Two

Click the arrow to play the video.



Dr. Isaac Maya  
Director of Research at CREATE

4:32

Survey Powered by Qualtrics

[CLICK HERE TO CONTINUE](#)

The image shows a screenshot of a video player interface. At the top, the 'DR DECISION RESEARCH' logo is displayed, followed by the text 'Questionnaire Phase Two'. Below this, a prompt says 'Click the arrow to play the video.' The video player itself shows a man, Dr. Isaac Maya, sitting at a desk in an office. He is wearing a suit and tie. A yellow text overlay identifies him as 'Dr. Isaac Maya, Director of Research at CREATE'. The video player has a progress bar at the bottom of the video frame showing '4:32'. Below the video player, there is a footer area with 'Survey Powered by Qualtrics' on the left and a red button labeled 'CLICK HERE TO CONTINUE' on the right.



# **Simulated Attack on a Commercial Airline at LAX**

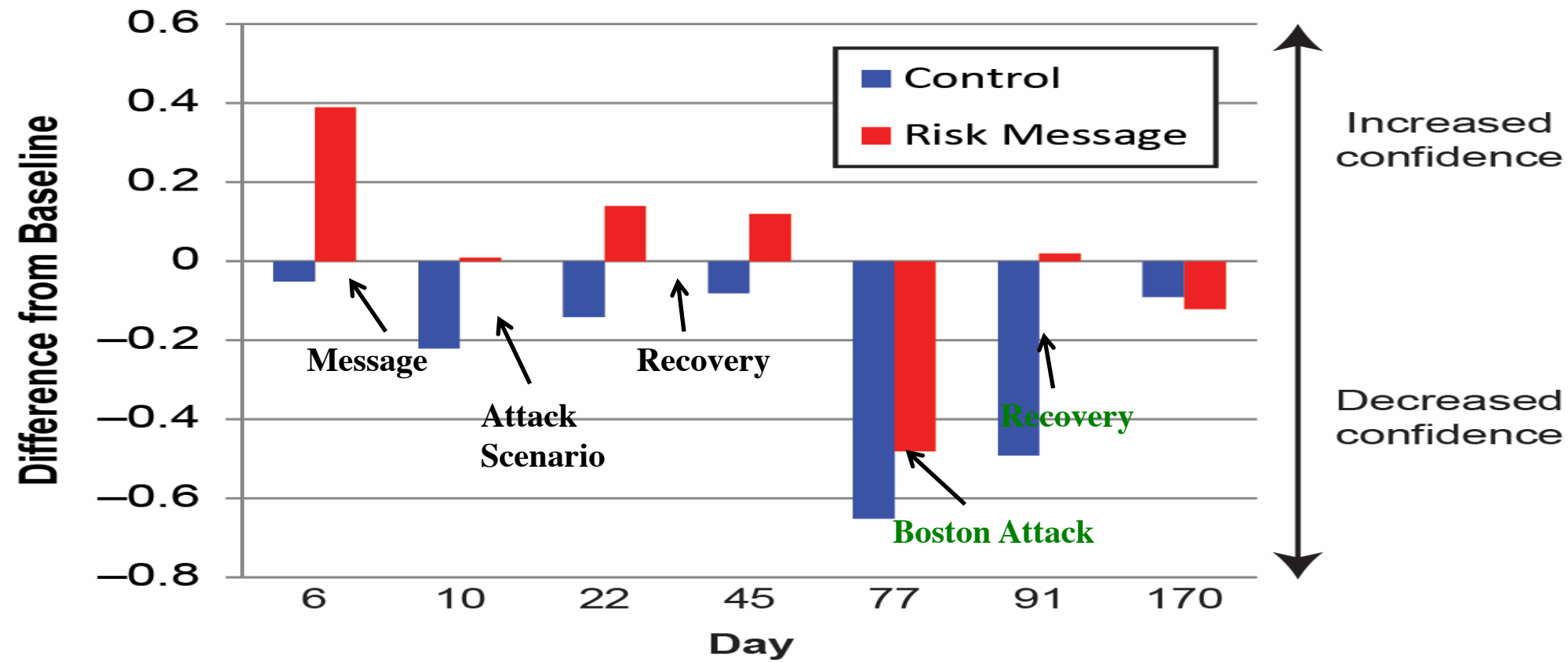
***Two Dead, 10 Injured and Plane Lands  
Safely***

**Video Clip: One Minute Simulated Newscast  
Narrated by Professional Actor**



Scale: 1-7  
Mean range:  
4.22-5.09

“In the Event of an Attack, the Department of Homeland Security Would be Effective in *Minimizing* the Harm from a Terrorist Attack”



**Figure 1.** Change in confidence in DHS’s ability to minimize harm following a terrorist attack.






# Economic Impacts of a Pre-Crisis Risk Communication Message

(Rose, Avetisyan, Rosoff, Burns, Slovic & Chan, 2016)

Impact of Risk Communication Message	No Message	Risk Message	Reduction
Domestic Airline Trips Lost	10.93%	10.35%	.58%
Domestic Airline Revenues Lost	\$8.9B	\$8.4B	>\$100M
Reduction U.S. GDP	\$13.1B	\$12.6B	>\$100M



**High Lever Policy:** *Moving the needle of public reaction even a little can have a large impact on economic impacts of adverse event*

# Public Response and Preparedness for Disasters

***Depends on Event Type, Skilled Response and Ability to Overcome Cognitive Biases***

***Public Tends to Recover Quickly – This is Good News but Can Lead to Shortsighted Planning***

***Perceived Risk and Negative Emotion Lead to Potentially Large Economic Impacts- Orders of Magnitude Larger Than Direct Impacts (loss of life, property damage)***

***Risk Policy Does Not Have to Move the Needle Very Far to Have Large Public Benefits***

***Risk Communication Yields a Significant Return on Investment***

# Pre-Crisis Inoculating Risk Communication: “Earthquakes and Tsunamis”

Professor Bobi Ivanov  
Associate Dean for Graduate Programs in Communication  
University of Kentucky  
[bobi.ivanov@uky.edu](mailto:bobi.ivanov@uky.edu)

**Note:** *The following examples are for illustration only. They have not yet been reviewed by subject matter experts or pilot tested in the laboratory or field.*

# Pre-Crisis Inoculating Risk Communication: “Fake News”

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Thanks for Your Attention

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# Inoculation Message Design with Example

- Explicit Forewarning (Explicit Threat)

*Our safety, and that of our loved ones is of paramount importance to us. It is our priority. As a result, we try to secure the safest housing for our families that we can. We escort our kids to school and recreational events. We make sure our vehicles are safe. We ask our children to buckle up. We make sure they wear helmets when they ride bikes. We teach them to avoid talking to strangers. We walk family members through fire drills. We drill in their heads that drinking and driving is not safe. We battle over the tendency to text and drive. We certainly make it known that smoking is not acceptable by bringing up all of the consequences associated with this long-term habit. So, we do our best to manage the risks in our lives and prepare for all contingencies possible to create a safe environment for us and our loved ones. Or do we? Although we may certainly feel as we have done all we can to manage the risks we face by creating a safer life for those around us, we may have ignored a clear danger that can have devastating consequences on our lives and communities. Large earthquakes and corresponding tsunamis have devastated lives and properties around the world. Many of the victims were unprepared for the events. Could we be next? Could we face the same fate? We may be more susceptible to these outcomes than we may think or care to admit. Experts suggest that we are 1,000 years behind Japan in terms of preparation for these events, and yet we have seen the recent devastating effects of earthquakes and tsunamis on Japan. Are we truly prepared?*

# Inoculation Message Design with Example

- Counterargument (Implicit Threat)

- *Of course, we have ignored earthquakes and tsunamis for a good reason. They are rare. How often do they occur? Are we even likely to face a strong enough earthquake for it to matter? Where is the evidence to suggest one is coming? Besides, this is something the authorities worry about and take care of. It's their job after all. They have this covered.*



# Inoculation Message Design with Example

- Refutation

*Unfortunately, the above thinking is a bit short-sighted and uninformed. Scientists suggest that the Cascadia region of the country has as high as one in three chances of experiencing a devastating earthquake in the next fifty years of magnitude that exceeds 8.0 on the Richter scale. This type of an earthquake will have devastating consequences resulting in the collapse of building structures and bridges across the impacted areas. In fact, Dr. Chris Goldfinger, a Geologist, Seismologist, and Professor at Oregon State University, estimates that faced with such an earthquake, 7 in 10 buildings, as well as most of the bridges, will collapse in the Cascadia area. In addition, landslides, liquefaction, and flooding are also likely consequences of such an earthquake. As a result, a significant collapse of the communities' infrastructure is very likely. The outcome may be so severe that Kenneth Murphy, the head of the FEMA division responsible for Cascadia, has stated that the division's "operating assumption is that everything west of Interstate 5 will be toast." Kathryn Schulz, a Pulitzer Prize winner and Writer for The New Yorker, clarifies this statement by suggesting that "the Cascadia earthquake is going to hit the Pacific Northwest like a rock hitting safety glass, shattering the region into thousands of tiny areas, each isolated from one another and all extremely difficult to reach."*

*Moreover, the comfort we take in knowing that the authorities are working on this issue may be misplaced. Part of the problem we face, Ms. Schulz suggests, is our obliviousness. Dr. Goldfinger insists that "most people think someone is handling this. And that's not true. No one is handling it."*

# Inoculation Message Design with Example

- Counterargument (Implicit Threat)

- *Even if no one is handling this issue, it is out of our control. There is not much we can do about it. That is something the authorities and the politicians have to figure out. We have very little impact on what can really be done to the infrastructure in our communities or our own homes. Unfortunately, there are just too many other pressing and immediate issues our politicians and authorities must deal with in the present like homelessness, increasing housing costs, etc. Focusing on things that may or may not occur in the future are just not realistic. There is little we can do to induce such change when politicians are worried about their reelection two, rather than fifty, years from now.*

# Inoculation Message Design with Example

- Refutation

*The above concerns are certainly valid. There are indeed pressing societal issues that must be addressed in the present. But our future and that of our children do not need to be sacrificed for the present. There are things we can do in the present to prepare for the future, both individually and collectively. Individually, we can take steps to invest in ourselves, the lives of our families, and our future. First, we can make sure that we secure earthquake and, depending on the area our communities reside, tsunami coverage. As previously suggested, an earthquake is likely to devastate as many as 70% of all buildings in the current state. A tsunami is likely to completely wipe out all standing structures in its wake. Are we prepared to lose everything? Is this a gamble we can afford to take?*

*Another step we can take is retrofit our homes to better prepare them to face a devastating earthquake. One consideration may be to bolt down our homes to the concrete foundation. Unsecured homes will quickly jolt off of their foundation in the face of a Cascadian earthquake. The cost of bolting a home may range in the neighborhood of \$2,000 to \$6,000, but the cost may be well-worth the return, if it means saving our homes. We can also strap down our water heaters. This is a fairly inexpensive approach to ensure our homes do not blow up like bombs when a big and heavy object (i.e. the water heater) collides with, or falls over, a gas line while the pilot is lit and providing a fire source.*

*Finally, there are things we can do to motivate change in our communities. We CAN demand better seismic safety from our politicians and authorities. We can collectively influence our local news agencies to write news stories reporting the dangers of Cascadian earthquakes, thus increasing the public and political consciousness regarding this issue. Parent-teacher associations and the school systems can demand from authorities and politicians that the safety of the schools is addressed by publically requesting the retrofitting of the buildings or their relocation to safer zones. Citizens can lobby their politicians and authorities to retrofit building and bridge structures, thus making these issues relevant at the ballot box in two, rather than, fifty years.*

# Inoculation Message Design with Example

- Counterargument (Implicit Threat)

- *An earthquake may or may not materialize but even if it does, Ms. Shultz, whose Pulitzer Prize was awarded specifically for her work on the seismic risk faced by the Pacific Northwest, advises that most of the people residing outside of the tsunami- inundation zone, will “almost certainly survive even the worst Cascadia earthquake.” So, this may not be as pressing of an issue as one may think. And besides, it is not like there is anything we can really do in advance to prepare for it other than lobby for, or invest ourselves in, structural changes of the present communal infrastructure or that of our homes. It is an earthquake after all. It can come at any time. It is not a tornado or hurricane for which we do get some fair amount of warning.*



# Inoculation Message Design with Example

- Refutation

*Unfortunately, it is this type of false sense of security and obliviousness that present a clear threat to our preparedness for such a disaster. The issue is that even if we were to survive such an event, even if our structures were to withstand the impact of such an earthquake, the biggest threat to our lives and well-being of our families may come immediately after the earthquake as devastated areas may be cut off from the supply of medicine, food, water, shelter for as many as six to eight weeks, according to some estimates. So, the important question should ask whether we are prepared to weather this much time without help. The probable answer, if we are honest with ourselves, is that we are not. At least not presently. But there are things we can do to better prepare ourselves, contrary to what we may intuitively believe. Indeed, there are things we can do to prepare ourselves for this situation. First, we may want to secure the heavy objects in our homes so they do not present danger to our family members when they get displaced as a result of the large tremor. We can also develop evacuation plans ahead of time to try to navigate out of the affected region. If this is not an option, we can prepare by securing ahead of time a supply of weeks-worth of water (at least one gallon per person per day), food, flashlights and batteries, a whistle, first-aid kits, tent, sleeping bags, prescription drugs, hand-cranked radio, etc.*

# Inoculation Message Design with Example

- Call to Action

*Cascadian earthquakes and possible corresponding tsunamis threaten to devastate the lives and properties of people residing in the Pacific Northwest. The danger, at times, may look negligible, unwarranted, or irrelevant. In that sense, it is not unlike an insurance policy. We purchase it and wonder whether it was a good investment. We wonder if we will ever use it as we pay it year after year. We wonder if it is worth the cost. We wonder whether we could have used the money more wisely and have spent it on something more immediate. Something more pressing. Something just more important. The truth is we may never truly see the value of an insurance.*

*In reality, we hope we never get our money back. We hope we never realize the true value of the insurance policy. We hope we never get to use it. But if we ever do, that is the time at which we truly realize the value of the insurance. At that moment, all of those sacrifices over the years to pay the policy, all of those investment doubts we fought off over the years are wiped away. Our decision, vindicated. Preparing for a Cascadian earthquake presents similar challenges, doubts, and rewards. We hope we never realize the rewards, but may need to prepare as if they are coming. Investing in our future and that of our children is important. In truth, we may never realize the benefits of our present sacrifices. But parents are not meant to do so. They protect their children selflessly as they shield their loved ones from all conceivable risks they are exposed to. As such, it may be time to do it again and secure our children's future not just five or ten years from now, but even fifty years from now. We may need to ask ourselves if our children are worth the sacrifice. Are our grandchildren worth it too? The people of Japan make infrastructural investments to ensure the benefits of those who come after them knowing fully well they may never personally benefit from the investments. Are we, as Americans, prepared to make the same commitment and investments?*

*Of course, what we decide to do it is up to us. Only we can decide how to proceed from here. But at least, now we know a bit more about the threat that Cascadian earthquakes and potential corresponding tsunamis present to the Pacific Northwest. Where we go from here, is in our hands. It is our call. It is our choice. It is our future.*

# Terse Inoculation and/or Booster Messages Examples

- Emergency Alert System
  - **“Some say an earthquake will not happen (*counterargument/forewarning*). There is a good chance it will (*forewarning/refutation*). Prepare yourself (*call to action*).”** (89 characters)
- Text Message
  - **“Some say we’ll survive an earthquake; so, danger’s limited (*forewarning/counterargument*). Don’t be fooled. Danger comes after earthquake. Trapped for weeks; no food/water (*refutation*). Prepare yourself (*call to action*).”** (159)
  - “Experts say you will likely survive an earthquake. So, no danger. Not if your home falls on you. 70% of homes will fall. Bolt your home down. Prepare yourself.” (159)
  - “Some say there is little we can do to prepare for earthquakes. Not true. Lobby your authorities/politician. Write a letter to news stations or start a petition.” (160)

# Terse Inoculation and/or Booster Messages Examples

- Twitter

- **“Some say there is little we can do to prepare for earthquakes (*counterargument/forewarning*). Not true. You can lobby your politician (*refutation*). Write a letter or start a petition (*call to action*).”** (139)
- “Some say we’ll survive an earthquake; danger’s limited. Danger comes after earthquake. Trapped for weeks; no food/water. Prepare yourself.” (138)
- “Experts say you will likely survive an earthquake. Not if your home falls on you. 70% of homes will fall. Bolt your home down. Get prepared.” (140)
- “Expert say you may survive an earthquake. But, if water heater falls on the gas line with pilot lit it may create explosion. Strap it down.” (139)



# Public response to Earthquakes, Tsunamis and Terrorism: Resources for Further Study

- Paul Slovic (2010). *The Feeling of Risk*, Earthscan Publishing: London.
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- Robert R. Ulmer & Timothy L. Sellnow (2017). *Effective Crisis Communication: Moving From Crisis to Opportunity*, Sage Publications, Inc: Thousand Oaks, CA.
- Paul Slovic (2001). *The Perception of Risk*, Earthscan Publications, London.
- Nick Pidgeon, Roger E. Kasperson & Paul Slovic (2003). *The Social Amplification of Risk*, Cambridge University Press: New York.
- Carol Tavris & Elliot Aronson (2015). *Mistakes Were Made (But Not By Me): Why We Justify Foolish Beliefs, Bad Decisions and Hurtful Acts*, Houghton, Mifflin, Harcourt: Boston.
- Albert Bandura (1997). *Self-Efficacy: The Exercise of Control*, W.H. Freeman Company: New York.

# Pre-Crisis Inoculating Risk Communication: “Fake News”

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# Inoculation Message Design with Example

- Explicit Forewarning (Explicit Threat)

*As individuals, we strive to be ethical and fair. We generally seek out and support information that is accurate and factual. In fact, our justice system is built on the notion of fairness as justice is part of our core, what makes us American. We have high desire to be factually accurate and take lot of pride in recognizing and sharing accurate information. Yet, these days we are under constant assault from the efforts by outlets and individuals dedicated to spreading inaccurate information intended not only to deceive us, but also to get us to partake in this deception by sharing the false information with others. Sure, we may think that these efforts are irrelevant as they are ineffective. After all, people do not fall for such deceptive practices.*

*Research tells us quite the opposite. Deceptive information is designed to appear real and legitimate. The Pew Research Center shows that two out of three individuals find the presentation of so called “fake” news to create a great deal of confusion where one in four people, in fact, shares the made-up story with others. The Pew Research Center found that nearly half of individuals would fail to identify more than three factual statements correctly, out of every five. Are we confident that we can do better? What makes us so sure? The reality is that deceptive information, if not properly identified, is threatening our ability to receive and share accurate information. It threatens our credibility when we share the false information with others. Many have fallen prey to the insidious attempts by other to manipulate us and we could be next, unless we learn to better evaluate deceptive information.*

# Inoculation Message Design with Example

- Counterargument (Implicit Threat)
  - *The story presented here looks very real. It sounds real. It makes a lot of sense. It may be consistent with our beliefs. It was picked up by numerous news outlets. It was shared by 6 million people all of whom cannot be wrong. So, it must be true. It must be real.*
  - *The story may look very real. It may sound real. It may even make a lot of sense. It may be consistent with our beliefs. It may be picked up by numerous news outlets. It may be shared by 6 million people all of whom cannot be wrong. As such, it must be true. It must be real.*



# Inoculation Message Design with Example

- Refutation

*However, it is not real. It is deceptive and designed to prey on the desire of some people for the message to be true. But, how do we know it is true or not? A careful examination of the news outlet shows a lack of history for the news outlet, thus signaling that something is amiss with the story. In addition, no author has associated his or her name with the story. After all, with such a career-making breaking story, an author would likely want to receive the credit, yet no author is listed. The article is also devoid of supporting claims. Further, a reverse image search through Google or Tin Eye shows that the image is authentic, but it is misused. Stated differently, the image shows ballot boxes in a British election, not the most recent presidential election in the U.S. Finally, a search for similar reporting from other news outlets would show lack of story confirmation from politically neutral sources. As such, it would be safe to conclude that the story is not true.*

MONDAY, OCTOBER 3, 2016

ChristianTimes  
Newspaper

NEWS ABOUT US POLITICS VIDEO RELIGION CHRISTIAN TIMES NEWS

Home > News > BREAKING: "Tens of thousands" of fraudulent Clinton votes found in Ohio warehouse

NEWS POLITICS

## BREAKING: "Tens of thousands" of fraudulent Clinton votes found in Ohio warehouse

By admin1 - September 30, 2016 46021 0

SHARE



Facebook



Twitter





# Inoculation Message Design with Example

- Counterargument (Implicit Threat)
  - *The story presented here looks very real. It sounds real. In fact, it confirms what you have thought all along. Your friend confirms it too. Many of your friends send you the tweet. Your favorite elected official mentions it and your favorite news personality swears by it. So, it has to be true. These many people would not put their credibility on the line unless it was true. It must be true.*



# Inoculation Message Design with Example

- Refutation

*Except it is not. Aside from the misspelled word signifying impeachment, a close look at the Twitter handle shows that the congresswoman's last name is spelled with two "V"s rather than a W, thus suggesting that the account is fake. Indeed, when evaluating news information it is important to check one's biases on the issue. Individuals in support of the message and tweet are often quick to accept the message at face value because it conforms with their beliefs. To avoid this error, one must be conscious of the effect this bias may have on how he or she looks at the information, if the goal is to be accurate and ethical with the information provided, rather than blindly accepting it because it conforms with one's beliefs. To do so, one must read past the headline with an inquisitive approach to properly assess the information provided.*



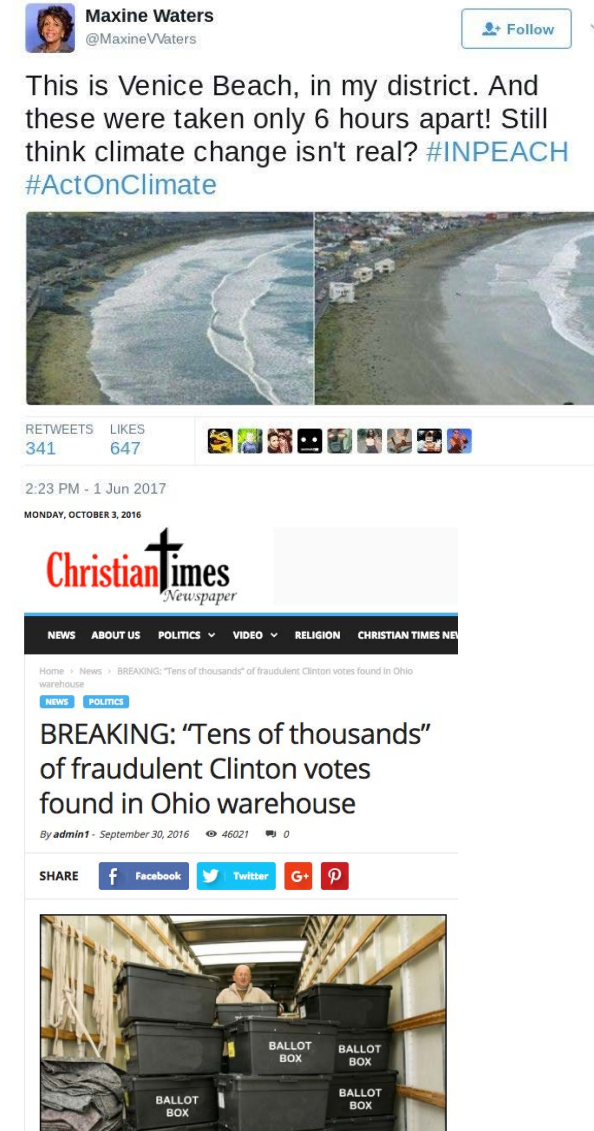


# Inoculation Message Design with Example

- Call to Action

*As earlier suggested, as individuals, we strive to be ethical and fair. We want to share accurate information as our credibility is at stake; our name and word are on the line. Yet, we are constantly bombarded with information, which may or may not be true. Some may be purposefully designed to deceive us. As such, we have the obligation to ourselves and others to properly detect which information is accurate and which one is deceptive. To do so, we must arm ourselves with, and practice, false news detection skills by: reading past the headline; making sure the claims in the study are supported by evidence or reputable sources; conducting reverse image searches; checking out the authors and news outlets publishing the story; searching other news outlets for similar sources; and be conscious of our own biases. Armed with these tools we must resist the temptation to quickly assess and accept news information as accurate.*

*Of course, what you decide to do it is up to you. But at least, now you know a bit more about the insidious ways in which false news are being pushed on us as media consumers. You also encountered some of the tools and approaches you can use to combat these “fake news” attempts, should you choose to do so.*





# Terse Inoculation and/or Booster Messages Examples

- Emergency Alert System
  - **“It will look real (*counterargument/forewarning*). It may or may not be. Be careful. Look for deception cues (*forewarning/refutation*). Be vigilant (*call to action*).”** (90 characters)
- Text Message
  - **“Shared news stories feel very real. They come from trusted others (*forewarning/counterargument*). But are they? Check for deception cues. Remember to consult multiple sources (*refutation*). Stay vigilant (*call to action*).”** (159)
  - “Social media stories appear very real. They may or may not be. Be careful. Look for deception. Remember to check the content. Use more sources. Stay vigilant.” (158)
  - “Shared news stories from trusted others feel very real. They may or may not be. Look for deception cues. Remember to read past the headlines. Stay vigilant.” (156)





# Terse Inoculation and/or Booster Messages Examples

- Twitter
  - **“Social media stories appear very real. They may or may not be (*counterargument/forewarning*). Look for deception cues. Remember to consult multiple sources (*refutation*). Stay vigilant (*call to action*).”** (140)
  - “Social media stories appear very real. They may or may not be. Look for deception cues. Are the sources real or impersonated? Stay vigilant.” (140)
  - “Social media stories appear very real. They may or may not be. Look for deception cues. Do visuals support the content? Stay vigilant.” (134)
  - “Social media stories look very real. They may or may not be. Look for deception cues. Content is real, but is it in context? Stay vigilant.” (139)



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# Supportive Slides



## *Lower Risk Signal*

**Natural Disasters**

**Explosions**

**Competence**

**Military/First Responders**

**Distant**

**Story Closure**

## *Higher Risk Signal*

**Terrorism**

**Biological/Radiological**

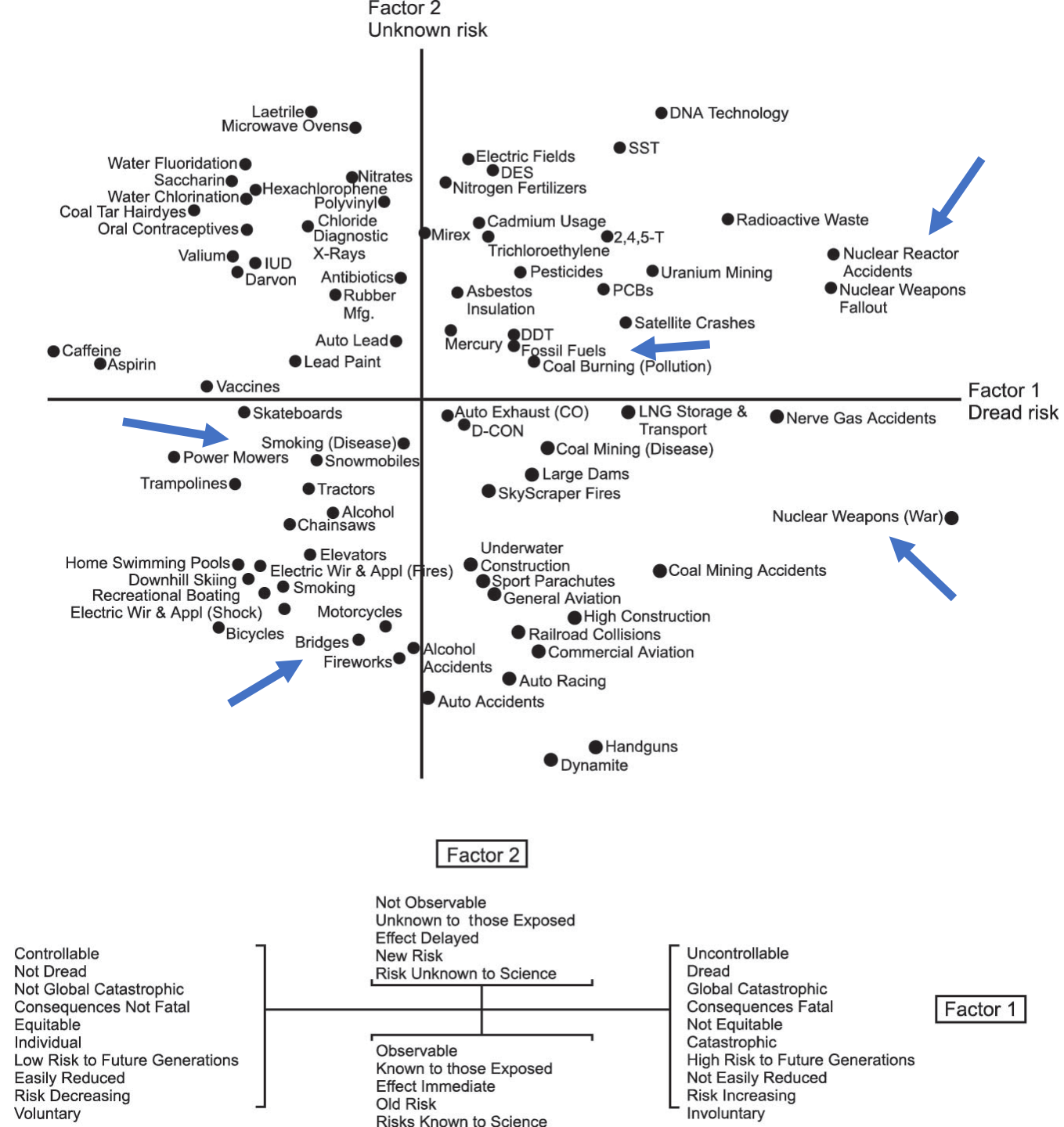
**Negligence**

**Children**

**Near**

**No Story Closure**





Domestic Terrorism?  
Cyber Crime?  
Global Warming?  
Information Warfare?  
Erosion of Truth?



**An Event as it is Occurring.**

## **Dirty Bomb Rocks Financial District of Los Angeles!**

**180 Dead and Hundreds Potentially Exposed to Radiation as Mayor Requests Downtown to Seek Shelter for Hours**

(An approximately 500 word scenario description followed together with an audio recording of the LA mayor-dramatization.)

**The Aftermath of the Event: One Month Later**

## **Radiation Levels Throughout Los Angeles Pose Little Threat says Panel of Health Officials!**

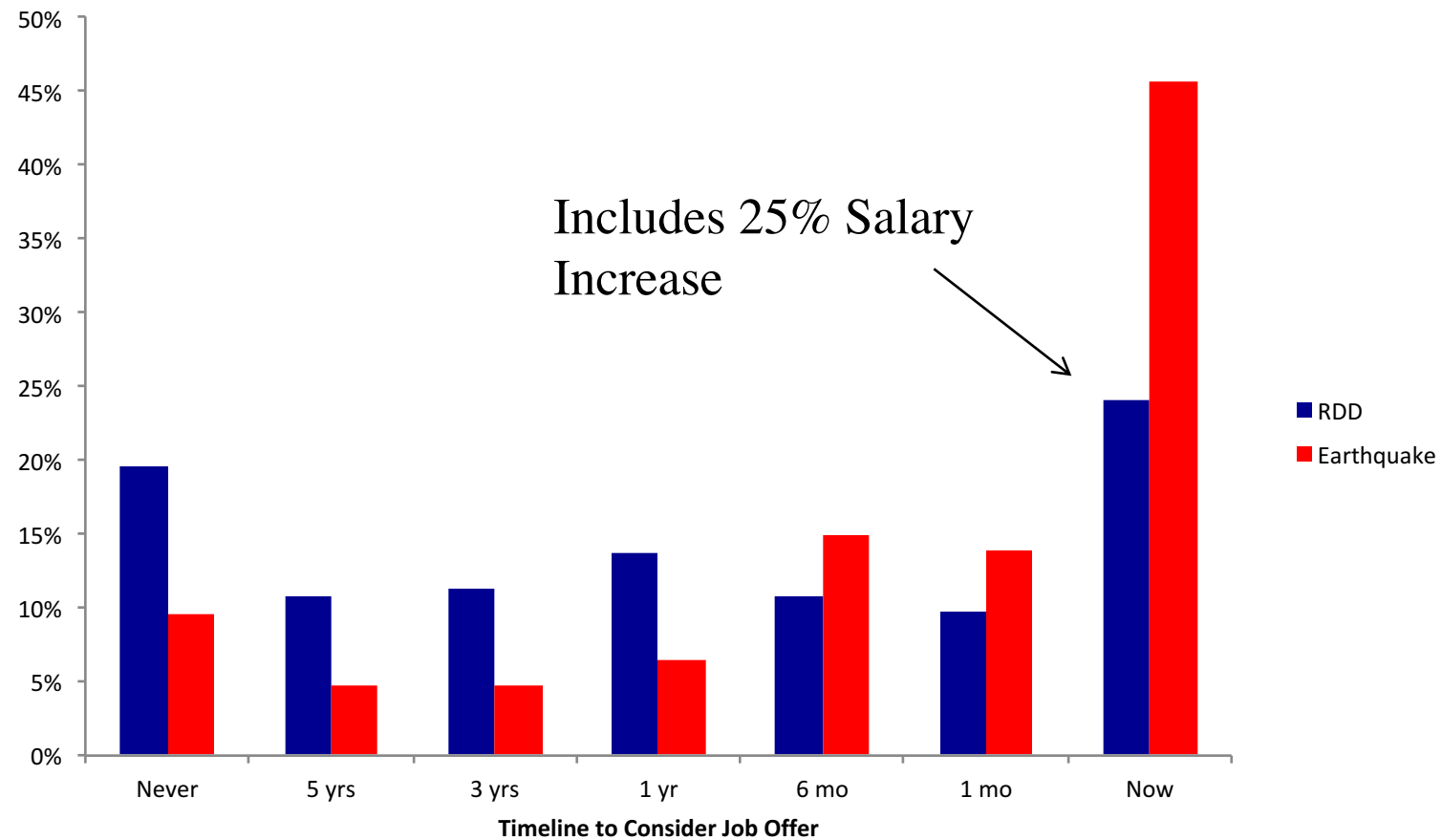
**Today the Mayor Received a Reassuring Report from a Team of Radiation Experts Regarding Long-term Health Risks. The Downtown to Re-Open.**

(An approximately 200 word scenario description followed together with an audio recording of the LA mayor-dramatization.)



# Job Offers: Dirty Bomb vs. Earthquake

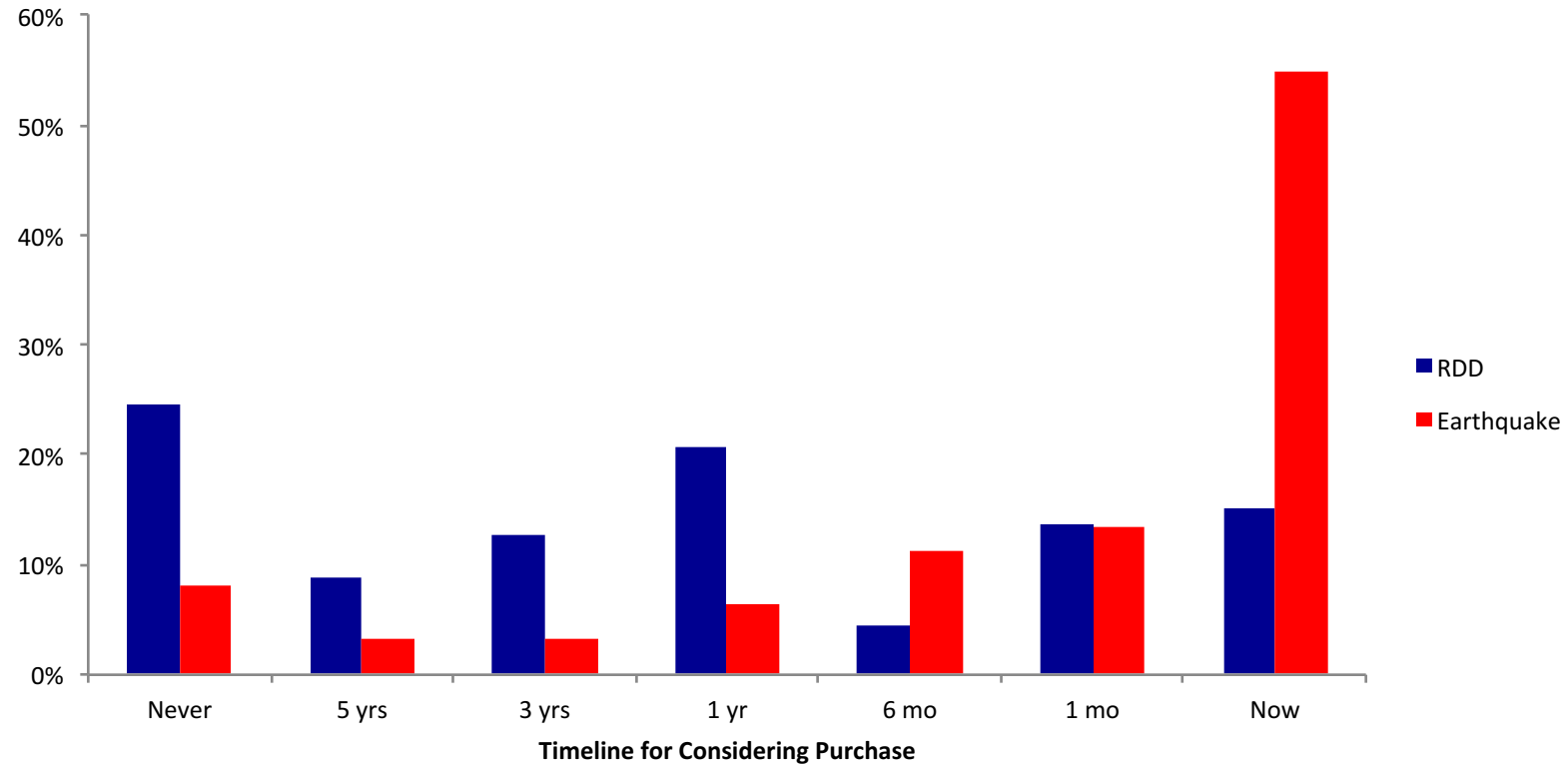
## Willingness to Accept Job Offer





# Specialty Products: Dirty Bomb vs. Earthquake

Willingness to Purchase Specialty Chocolate





# After Inoculation: Perceptions of Risk to Future Quality of Life

How great is the risk posed to your future quality of life and that of your family from each of the following?

Scale: 7pt.

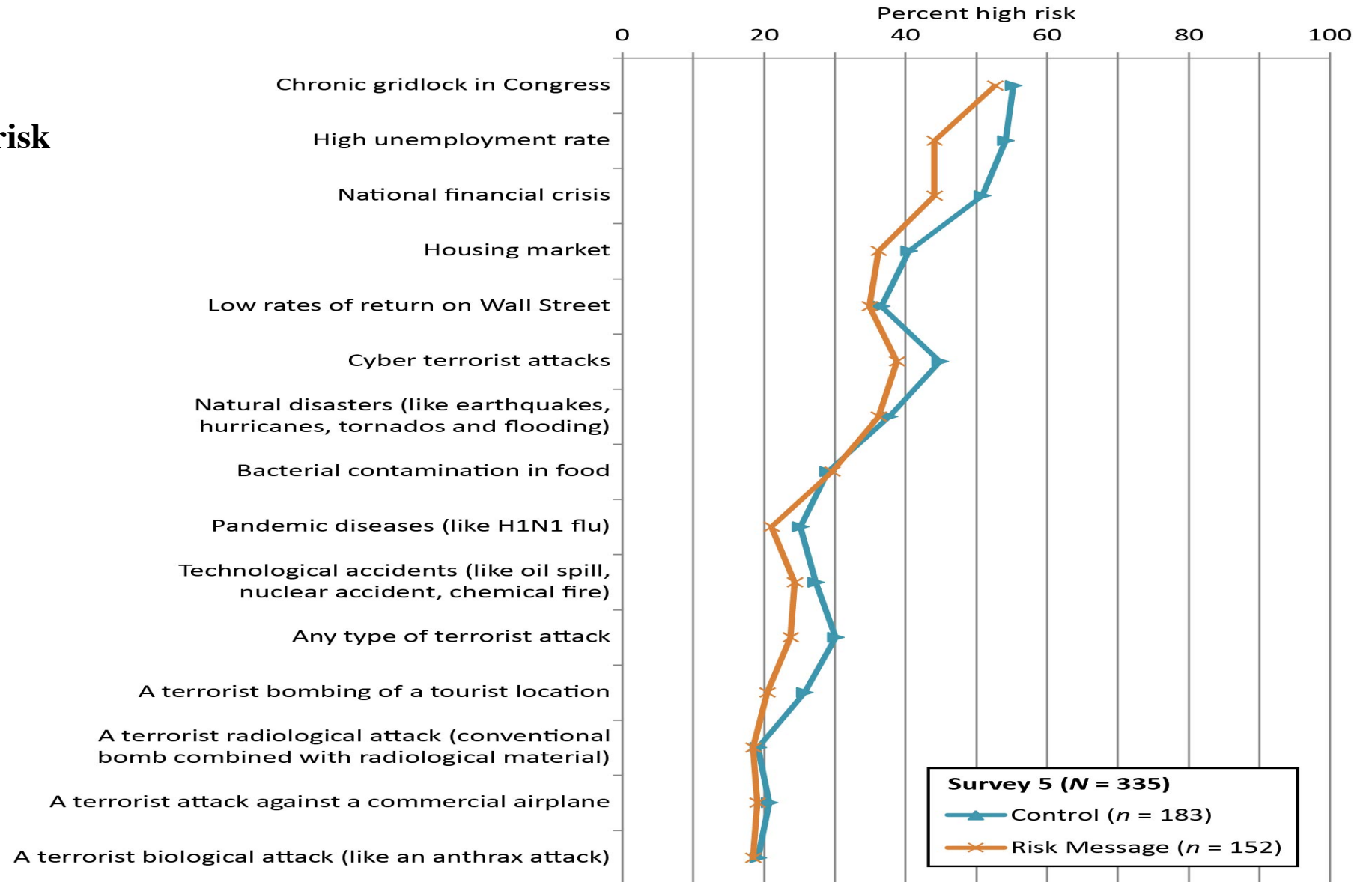
Range: 20% -55%

No risk-Extremely high risk

Survey 5

2013

N=335





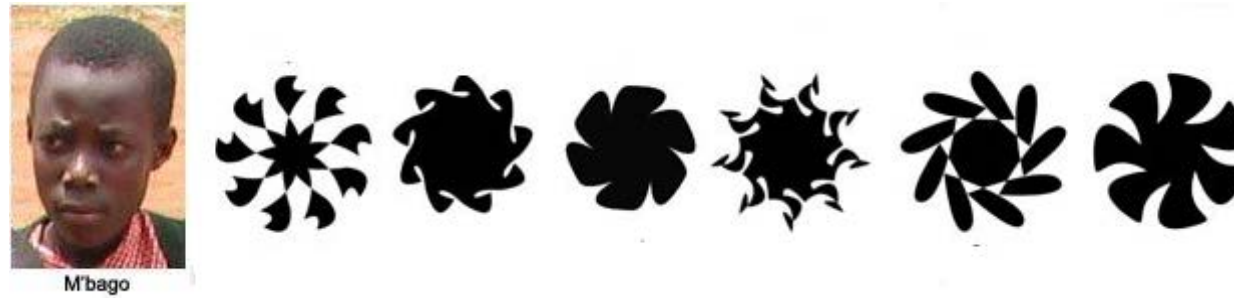
## Economic Impacts of Airline Attack Without Inoculation Risk Messaging

Impact of Airline Attack	Year 1	Year 2	Total
Domestic Airline Trips Lost	7%	4%	11%
Domestic Airline Revenues Lost	\$5.6B	\$3.3B	\$8.9B
Reduction U.S. GDP	\$8.0B	\$5.1B	\$13.1B
Ratio: Behavior/Ordinary Loss (GDP)			9x

**Behavioral  
Leverage**

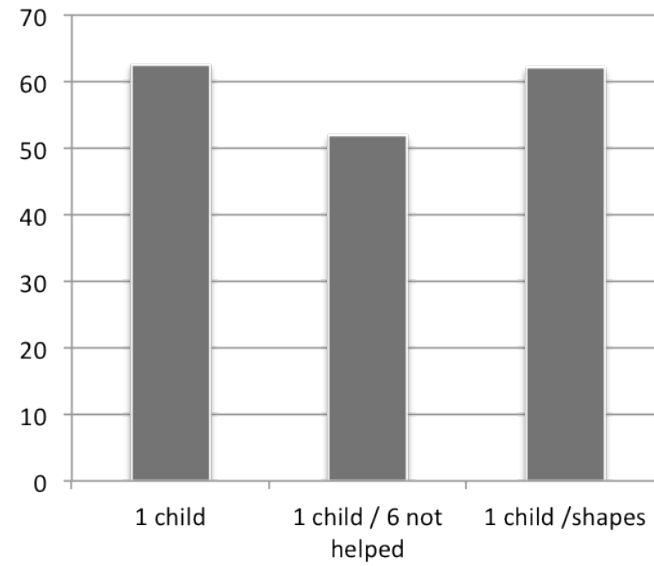
A black arrow originates from the text 'Behavioral Leverage' and points diagonally upwards and to the right, specifically towards the '9x' value in the 'Total' column of the table's final row.





*Figure 3.* Child and shapes used in the visual distraction experiment in Study 5a.

Neutral distractor shapes had no effect on warm glow.



*Figure 4.* Mean warm-glow ratings across the different conditions in the distractor study.

So it is the negative imagery that diminishes warm glow.