

A Difficult Balance: Risk Perception and Risk Communication
in an Age of Terrorism

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This report examines responses to terrorism risks exhibited by members of the general public. Questions to be addressed here include:

- What are the difficulties in rationally assessing risks from terrorism?
- Why and under what circumstances do cognitive distortions affect terrorism risk perception?
- What factors affect the way individuals think about their lives and their futures in a world beset by terrorist acts?
- How does vulnerability to terrorism affect behavior and mental health?

These questions will be considered within the context of a more general question: How can we best educate and communicate to the public regarding the risks of terrorism?

There are two interpretations of the term “a difficult balance” in my title.

- There is a difficult balance between alerting and informing people about serious risks and creating exaggerated and harmful fears.
- There is a difficult balance between assessing terrorism risks analytically and assessing such risks emotionally and affectively.

I shall discuss both of these challenging balancing acts.

Scoping the Problem

Let’s first take broad look at the problem. We see that risk communication depends greatly upon technical assessments of risk and also upon processes of risk perception.

Risk assessment faces major difficulties. First, there are myriad forms of terrorism (Figure 1). Many of these are relatively new and we lack information necessary to inform risk assessment. A major problem is that our understanding and models of the hazard generating process, “terrorists’ minds” are too crude to permit precise predictions of where, when, and how the next attacks might unfold. This “new species of trouble” (Erikson, 1994) strains the capacity

of quantitative risk analysis and thus limits what can be communicated. One can legitimately question the role and capability of risk assessment when the uncertainties are so enormous.

Turning to risk education and communication reveals several key questions:

- What does the public want to know?
- What does the public need to know?
- What useful information do we have to communicate?
- What public misconceptions can be corrected?
- How can public fears and anxieties be kept in balance?

Perception of Risk

Understanding risk perception is essential to effective education and communication. Risk perception has been studied extensively during the past 30 years (Slovic, 2000). One key finding is that every hazard has a unique profile of qualities (much like a personality profile) that influences perception and acceptance of its risk. For example, nuclear power and x-rays, two radiation hazards, have very different perception profiles that lead nuclear power risks to be seen as greater and less acceptable than the risks from x-rays. Terrorism hits all the “risk perception hot buttons,” intentionally so. It has vivid and dreadful consequences, exposure is involuntary and difficult to control (avoid), it is unfamiliar, often catastrophic, and caused by human malevolence. Philip Zimbardo, recent President of the American Psychological Association, characterized it well:

Terrorism is about psychology. It is about taking strategic actions that incite terror and fright in civilian populations. Terrorism is about making ordinary people feel vulnerable, anxious, confused, uncertain, and helpless . . . The power of terrorism lies precisely in its pervasive ambiguity, in its invasion of our minds (Zimbardo, 2003).

One of the most pervasive findings in the field of risk perception is optimism bias (Weinstein, 1989). People believe they are at less risk than other people, from a wide range of threats. However, terrorism is an exception as shown in a disturbing study in Israel by Klar, Zakay, and Sharvit (2002). They found no evidence for optimism bias among Israelis. Everyone felt vulnerable, unable to control or avoid the risk. As a result, important activities of normal living were inhibited and quality of life suffered, without any benefits being perceived to result from such actions.

Risk as Feelings

We are familiar with attempts to analyze risk logically and scientifically, by means of various forms of technical risk assessment processes. But we have also come to appreciate the importance of a second mode of thinking about risk, which is even more common. This is the experiential mode, described by Epstein (1994) and many other “dual-process” theorists (Chaiken & Trope, 1999), which characterizes risk as a feeling of danger (Slovic et al., in press). Epstein observed:

There is no dearth of evidence in everyday life that people apprehend reality in two fundamentally different ways, one variously labeled intuitive, automatic, natural, non-verbal, narrative, and experiential, and the other analytical, deliberative, verbal, and rational (p. 710).

Table 1, adapted from Epstein, further compares these modes of thought. One of the main characteristics of the experiential system is its affective basis. Although analysis is certainly important in some decision-making circumstances, reliance on affect and emotion (e.g., risk as a feeling) is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world. It was the experiential system, after all, that enable human beings to survive during their long period of evolution. Long before there was probability theory, risk

assessment, and decision analysis, there were intuition, instinct, and gut feeling to tell us whether an animal was safe to approach or the water was safe to drink. As life became more complex and humans gained more control over their environment, analytic tools were invented to “boost” the rationality of our experiential thinking. Subsequently, analytic thinking was placed on a pedestal and portrayed as the epitome of rationality. Affect and emotions were seen as interfering with reason.

One of the most comprehensive and dramatic theoretical accounts of the role of affect and emotion in decision making was presented by the neurologist, Antonio Damasio (1994). In seeking to determine “what in the brain allows humans to behave rationally,” Damasio argued that thought is made largely from images, broadly construed to include perceptual and symbolic representations. A lifetime of learning leads these images to become “marked” by positive and negative feelings linked directly or indirectly to somatic or bodily states. When a negative somatic marker is linked to an image of a future outcome, it sounds an alarm. When a positive marker is associated with the outcome image, it becomes a beacon of incentive. Damasio hypothesized that somatic markers increase the accuracy and efficiency of the decision process and their absence, observed in people with certain types of brain damage, degrades decision performance.

We now recognize that the experiential mode of thinking and the analytic mode of thinking are continually active, interacting in what we have characterized as “the dance of affect and reason” (Finucane, Peters, & Slovic, 2003; Slovic et al., 2002). While we may be able to “do the right thing” without analysis (e.g., dodge a falling object), it is unlikely that we can employ analytic thinking rationally without guidance from affect somewhere along the line. Affect is essential to rational action. As Damasio observes:

The strategies of human reason did not develop, in either evolution or any single individual, without the guiding force of the mechanisms of biological regulation, of

which emotion and feeling are notable expressions. Moreover, even after reasoning strategies become established . . . their effective deployment probably depends, to a considerable extent, on a continued ability to experience feelings (p. xii).

Risk Imagery

A central tenet of the experiential system is that images, linked to affect, strongly influence behavior. Figure 2 shows one of these dramatic images of the 20th century, the mushroom cloud from an atomic explosion. This image, burned in the psyche of millions of Americans, has greatly hindered the development of nuclear power, “the peaceful atom,” as Kirk Smith has observed:

Nuclear energy was conceived in secrecy, born in war, and first revealed to the world in horror. No matter how much proponents try to separate the peaceful from the weapons atom, the connection is firmly embedded in the minds of the public.

More than a half-century later, Slovic et al. (2000) found that peoples’ dominant associations, when asked what thoughts come to mind when they hear the words “nuclear power,” had to do with bombs, war, death, and destruction – and not electricity.

Similarly, images from September 11, 2001, are emblazoned upon the memories of almost all who were alive on that date (Figure 3). We can expect such images to profoundly influence individual and societal behavior over the next century.

One key finding from risk perception research is that people seek to draw meaning from risk incidents, e.g., what does this mean for me? Is this an indication that this risk is greater than was thought? etc. A powerful meaning underlying images from September 11 and ensuing terrorist incidents (e.g., anthrax, smallpox, the Washington area snipers) is one

of vulnerability. It was startling to witness the degree to which a handful of determined individuals, in a very short time, so greatly disrupted the world's most powerful nation.

Probability Neglect

Although “risk as feelings” contains strong elements of rationality, reliance upon imagery and affect can also lead people astray. One of the most powerful cognitive distortions arising from risk as feelings and associated with risks from terrorism is probability neglect. Probability neglect has been demonstrated in laboratory studies by Rottenstreich and Hsee (2001) who showed that strongly affective outcomes, such as a painful electric shock or a kiss from one's favorite movie star, remain almost as aversive (shock) or attractive (kiss) when their probability is small ($p = .01$) as when it is high ($p = .99$). This same phenomena is seen outside the laboratory in people's extreme aversion to minute exposures to carcinogens or their mania for buying tickets to the national lottery when the prize becomes exciting despite the minuscule probability of winning (e.g., 1 chance in 80 million). As Loewenstein et al. (2001) observe, one's images and feelings associated with winning the lottery are likely to be similar regardless of the probability.

Legal scholar, Cass Sunstein (2003) examines probability neglect and its implications in the context of terrorism.

People are prone to . . . *probability neglect*, especially when their emotions are intensely engaged. Probability neglect is highly likely in the aftermath of terrorism. People fall victim to probability neglect if and to the extent that the intensity of their reaction does not greatly vary even with large differences in the likelihood of harm. When probability neglect is at work, people's attention is focused on the bad outcome itself, and they are inattentive to the fact that it is unlikely to occur (p. 121).

Sunstein argues that probability neglect causes extreme overreaction to terrorist threats by both public officials and citizens. In noting the costly consequences of public fear and alarm, Sunstein argues that government should take action that reassures people, even if such actions are not justified on technical grounds (i.e., even if they don't really reduce the threat but only appear to do so).

Toward Better Communication of Terrorism Risks

What can be done to communicate risk from terrorism in a balanced way, respectful of the threat yet not creating undue psychological stress? Because perceived lack of control is a key factor behind high risk perception and perceived vulnerability, it is important to educate the public about whatever careful and effective methods are being undertaken to control the risk.

Another lesson from risk research is that communication by authorities will not be effective without trust (Slovic, 1993). The critical importance of actions that build and maintain trust and must be recognized as well as the fragility of trust – it can quickly be destroyed and, if this occurs, it can be regained only with difficulty.

Some dreadful consequences of terrorist acts are not easy to accomplish because nature and technology make things difficult. Some biological and chemical toxins are fragile and hard to disperse in the environment. People should be made aware of these natural and technological controls over the threat. Not everything that can be imagined can actually occur.

Another element of control lies with the public. There are some things one can do to avoid exposure and minimize risk. These are, of course, specific to the type of threat. The public should be informed about specific actions they can take to reduce risk. These must be valid and clearly communicated, unlike some of the warnings that people found

almost laughable (seal your home with duct tape) and contradictory (stay in your home in the event of a radiological incident yet get as far away from the source as you can).

Zimbardo (2003) has written a scathing critique of seven major warnings issued by the U.S. government, including the vague system of color coding (be alert) associated with supposedly high levels of threat that never materialized (false alarms) yet were not called off when the “threat” supposedly diminished.

When strong affect or fear threatens rational action, reason should be called upon to dampen such reactions. For example, those driving long distances because of fear of flying should be educated about the far greater risks associated with driving (Sivak & Flanagan, 2003). Those bringing a handgun into the home for “protection” should similarly be informed of the great risks that entails (Kellerman et al., 1993).

It seems obvious that designers of risk education and communication programs should work with experts in these fields yet this does not seem to be happening.

An important lesson learned by those who have attempted to build risk education and communication programs is that one needs to work iteratively with the intended audience for these messages. Designers need to listen to the public’s concerns, collaborate in message development and test messages and programs to see if they are working as intended (Fischhoff, 2002). Most important, all this should be done in advance of any crisis.

Immense resources are being directed at the physical and operational aspects of reducing the threat from terrorist attacks. Significant support must also be given to education, communication, and mental health efforts. Research is needed and should be encouraged and funded.

Part of the research effort should be directed at understanding the pervasive impact of terrorism events and terrorism images on feelings of vulnerability, mental health, and the overall well-being of society. How are people's lives, their interactions with family, friends, and society, and, more fundamentally their minds, altered by living in a world subject to terrorist actions?

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Table 1

Two Modes of Thinking: Comparison of the Experiential and Rational Systems

<u>Experiential System</u>	<u>Rational System</u>
1. Holistic	1. Analytic
2. Affective: pleasure-pain oriented	2. Logical: reason oriented (what is sensible)
3. Associationistic connections	3. Logical connections
4. Behavior mediated by “vibes” from past experience	4. Behavior mediated by conscious appraisal of events
5. Encodes reality in concrete images, metaphors and narratives	5. Encodes reality in abstract symbols, words and numbers
6. More rapid processing: oriented towards immediate action	6. Slower processing: oriented towards delayed action
7. Self-evidently valid: “experiencing is believing”	7. Requires justification via logic and evidence

Note: Adapted from Epstein, 1994

Figure 1

Risk Assessment

The first problem:

What terrorism risks are we communicating about?

- attacks on and with commercial airliners
- dispersion of biotoxins
- dispersion of toxic chemicals
- dispersion of radioactive materials
- suicide bombings
- attacks with other weaponry
- cyber terrorism
- ?

Figure 2



Figure 3

