Radiation Safety Counseling News

How We are Prone to Errors in Decisions for Radiation Safety - Part V

Dear Reader,

Ray Johnson

We are prone to errors. In this series of articles we are looking at how quick decisions for radiation safety are prone to intuitive errors. Making quick decisions for safety is an important function of the subconscious mind for our survival. Such quick decisions, however, are typically based on stored impressions and images which may have little relevance to the real world of radiation. This article will continue to review how biases occur in safety decisions as described in Daniel Kahneman's book.

As always, your questions or feedback are welcomed. Feel free to contact us through email, our blog, or our Facebook page.

Regards,
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More Sources for Errors

We continue in this series of articles to look at ways we are prone to intuitive errors when making decisions for radiation safety. Insights for these articles are drawn from the book by Kahneman[1].

Availability Heuristic

This has to do with how people estimate the frequency of some event. Answers to questions of frequency are influenced by how easily instances are retrieved from memory. If retrieval is easy, the event will be judged as frequent. Kahneman's studies have shown, however, that impressions of ease of recall may occur without actually recalling any specific instance. This occurs because our subconscious mind is quick to substitute a different question when the answer to a posed question is not immediately available. For example, if someone is asked about the safety of nuclear power plants in the US, without any data on US plants, a person may immediately recall Fukushima and conclude that nuclear power is not safe. Personal experience or knowledge also plays a big role. If you know of several people with prostate or breast cancer, it is easy to conclude there must be an epidemic of those cancers. As we have

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noted in previous articles, once the subconscious mind has drawn a conclusion (even though strongly biased by ease of recall), the conscious mind is not inclined to exert effort to evaluate specific data that may refute the conclusion.

Kahneman says that people are more likely to go with subconscious impressions and be more strongly influenced by ease of retrieval rather than content when:

- They are engaged in another task requiring conscious effort
- They are in a good mood
- They are knowledgeable novices on the subject, rather than true experts
- They strongly believe in intuition
- They feel powerful

An example related to radiation safety has to do with how people generally view risks of radon exposures in their home. Since there are currently few news stories about radon, many will have little to recall about radon from memory and may conclude it must not be an issue any more. As a result, they are likely to underestimate the risks. This conclusion is derived subconsciously without evidence of any data.

The Dynamics of Memory

Large scale emergencies tend to follow patterns of a disaster leading to concerns and then complacency. People along the coast of Japan were in a mode of complacency about the highest flood wave of a tsunami, because they had lost the historical memory of the previous high water mark from several generations ago. Thus, images of a worst case disaster did not come easily to mind. After the terrible devastation and loss of life in the 2011 tsunami, concerns are now at a high level and will continue for another generation or two. As the devastation is restored future generations may fall back into complacency. Hiroshima is another example. Today it is a modern, busy, thriving city. Except for a few buildings preserved for the memory of the bombs, no one could tell by looking at the city today, that it was destroyed in 1945.

The Effect of Media Coverage

It probably comes as no surprise that estimates of risks are strongly influence by media stories. For example, news coverage of damage by tornados may lead many to conclude that tornados are more frequent killers than asthma. In fact asthma kills hundreds or thousands of times more people than tornados. Because of media coverage of the Fukushima nuclear accidents, many will now conclude that nuclear power is exceedingly dangerous, even though no one has actually died from radiation exposures at Fukushima. In fact, they may easily conclude nuclear power is more dangerous than tsunamis, even thought about 20,000 people died or are lost from the tsunami. The media is also biased in its coverage because of people's demands for more coverage of unusual events. Rare events when publicized in the media may lead people to conclude that these events are common. Public reaction then stimulates more media coverage and finally the government sees a need to investigate and hold hearings which attracts more media coverage.

The Affect Heuristic

Paul Slovic[2] developed the insight that people commonly make judgments and decisions based on their emotions. People make decisions based on what they like or dislike, or how they feel about a subject. Decisions are made about risks as an expression of feelings. Risks are judged as high or low based on feelings without any actual data. We noted in an earlier article that when asked to judge radiation risks, many will respond with an answer to a different question, "How do I feel about getting cancer?" This question can be answered by

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feelings without requiring any data or conscious evaluation. Emotional appeal is a powerful force in making decisions for safety. Emotions and feelings will win over rational thinking every time. James Tarpinian gave me a quote attributed to Abraham Lincoln, "You can't reason a man out of a position he didn't reason himself into."

Expert vs. Public Views of Risks

While experts tend to evaluate risks numerically as number of lives lost, the public may distinguish between "good deaths" from natural causes, versus "bath deaths" which occur from random events. Thus, the public may have a richer concept of risks than the experts. Slovic argues that risk is not a concept waiting to be measured. Rather risk is a concept invented to help us understand and cope with dangers and uncertainties of life. While experts may view risks in terms of rational weighing of costs and benefits, the public is much more subjective (and often viewed as wrong by experts). For example every police department has data on accidents that occur as a result of use of cell phones in cars. And yet, how many people ignore the statistics and conclude that they can both text and drive at the same time. Conversely, despite all of the expert reports on the likelihood of few radiation related deaths from Fukushima, many evacuees likely believe that their future health is at significant risk from radiation.

Terrorists Take Advantage of the Availability Heuristic

The media plays into the hands of terrorists by continuously reporting the number of casualties from the latest car bomb incident while ignoring the far greater casualties occurring from automobile accidents. Constant reminders and gruesome pictures make terrorist acts seem more common and cause everyone to be fearful. What would possibly happen to the practice of terrorism if the media stopped reporting such events?

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[1] Kahneman, D., "Thinking, Fast and Slow."Farrar, Straus, and Giroux, New York, 2011.
[2] Slovic, P., Finucane, M., Peters, E, and MacGregor. D., in "Heuristics and Biases," Gilovich, T., Griffin, D, and Kahneman, D., Editors. Cambridge University Press, New York, 2002.