



# Radiation Safety Counseling News

## How We Make Decisions for Radiation Safety - Part II

Dear Reader,

The topic for this month was originally introduced in our Newsletter in January 2012. That Newsletter drew upon observations from a recent book by David Ropeik, **"How Risky is it, Really? Why Our Fears Don't Always Match the Facts."** The McGraw Hill Companies, Inc. 2010 (Amazon - \$13.60).

This month I would like to introduce readers to another recent book by Daniel Kahneman (Nobel prize in economics) **"Thinking, Fast and Slow."** Farrar, Straus, and Giroux, New York, 2011.

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

Regards,

[Ray Johnson](#)

[ray@radiationcounseling.org](mailto:ray@radiationcounseling.org)

Radiation Safety Counseling Services



Ray Johnson

Quick Links

[Website](#)

[Forum/Blog](#)

[Facebook](#)

Join Our Mailing List!

We are on

facebook

We have created a Facebook page for the Radiation Safety Counseling Institute. This is another resource for the sharing of radiation safety related information and questions.

Click below to visit our page!

Find us on Facebook

## How We Make Decisions for Radiation Safety - Part II

### Beliefs about Decision Making

Kahneman's book is intended to raise questions about our common beliefs in the ways we make judgments and choices. He notes that most of the thoughts and impressions which come to our conscious mind arise without our knowing where they came from. For example, can we trace the process of detecting irritation in our spouse's voice or how we avoided an obstacle in the road before becoming consciously aware of it? The mental work that produces impressions and decisions is based on intuition which goes on in the silence of our minds. This book is about biases in intuition that affect our decisions.

### Intuitive Biases

Kahneman notes that even after teaching and using statistics for years, he had not developed an intuitive sense of the reliability of statistical results. He found that he was too willing to believe research findings based on inadequate evidence and prone to collect too few observations in his own research. A survey showed that other expert colleagues also exaggerated the likelihood that experimental results would be confirmed, even with a small sample. One study conducted with a colleague showed that participants ignored relevant statistics and relied on **"resemblance"** as a simplifying rule of thumb (heuristic) for

### Got Questions?

If you have a question about radiation safety that you would like to share, please post your question on our Forum (blog) or our Facebook page. Each week our experts will select a question and post an answer that will also be included in our monthly newsletter.

To post a question go to:

[Radiation Safety Forum](#)

or

[RSCI on Facebook](#)

making a judgment. In other words, they ignored data in favor of information that resembled something they already knew about.

In another study they found that participants made judgments based on how easy they could "**recall**" certain events as a basis for generalizing a conclusion. People tend to assess the relative importance of issues based on how easily they can recall events, which may be largely determined by media coverage. This is an interesting paradox, because the media tends to report what seems to be currently in the public's mind. Kahnman's studies were to demonstrate possible flaws in our thinking which occur outside of our awareness. Our minds are susceptible to systematic errors of intuition.

### Emotion as a Basis for Judgments

Studies are showing that emotion is a large factor in intuitive judgments and choices. Decisions are often guided by feelings of liking or disliking, with little deliberation or reasoning. When a question is difficult and a knowledgeable solution is not readily available, an answer may still come quickly to mind. But, the answer may not specifically respond to the original question. Rather, in place of the difficult question we "**substitute**" an answer to an easier and related question (having to do with what we like or dislike). Since this substitution is outside of our conscious awareness, it will usually go unnoticed.

### Two Systems of Thinking

Kahneman refers to earlier researchers who describe two systems for judgments characterized by fast thinking and slow thinking.

- **System 1** operates automatically and quickly with little or no effort and no sense of voluntary control. This process is described in the January 23, 2012 Newsletter as workings of the subconscious mind.
- **System 2** devotes attention to demanding mental activities that require effort. This is the relative slow working of our conscious mind that has beliefs, makes choices, and decides what to think about and what to do.

While we generally identify ourselves with System 2, the automatic System 1 is the basis for effortless origination of impressions and feelings that are the main source of explicit beliefs and deliberate choices of System 2. We are born with innate System 1 skills for perceiving our world, recognizing objects, orienting our attention, and avoiding danger. As we mature we also learn new skills, such as reading and interpreting nuances of social situations. All processes that become automatic, such as athletic or game skills, playing a musical instrument, driving a car, or knowing that  $2 + 2 = 4$  are System 1 functions. **"System 1 is the secret author of most of our judgments and choices."**

### System 1

We are born with innate skills to perceive the world around us, recognize objects and people, and orient our attention to avoid losses. As we mature we build on this innate resource through learning, impressions, and experience. Subsequently this knowledge is drawn upon by System 1 automatically without conscious intention or effort. Mental activities associated with skills derived from prolonged practice also become fast and automatic. Basically all of the actions, decisions, and functions which we perform without thinking about them are System 1 functions. As noted in the January 2012 Newsletter, System 1 or our subconscious mind is an enormous super computer which operates the machine which we call our body. This system is able to handle thousands of inputs simultaneously to regulate our hearts, breathing, digestion, healing of cells, etc, without any conscious or thinking effort.

## Communication Insights

Each week, we post another installment of guidance to improve communication with others. To stay informed, you can go to our [blog](#) and click on Follow: RSS, then choose to "Subscribe to this Feed".

You can also go to our [Facebook](#) page and choose "Like" to have our status updates displayed on your Facebook wall.

We hope you find this information helpful and welcome your comments, questions, or other feedback.

## System 2

Functions of this system have one feature in common. They require attention and these functions are disrupted when attention is diverted. In other words, System 1 can basically only do one thing at a time. The admonition to "pay attention" is appropriate for this system. We have a limited budget of attention and will fail if we try to go beyond our budget. A current example is what happens to a driver's attention when he/she is talking on the cell phone or even worse if they are texting. We have all observed a car weaving over the lines in the road and then saw the driver engrossed in a cell phone conversation. The same inattention to surroundings applies to persons walking and talking on their cell phones. Intense focusing on one task can essentially make us blind to other stimuli that would normally attract our attention. Thus, we can become blind to the obvious and blind to our blindness. People on cell phones do not realize that their attention has drifted away from driving or walking.

## Conflict of Systems for Radiation Risk Decisions

Both systems function continuously while we are awake. System 1 runs automatically and System 2 is comfortable in a low-effort mode in which only a fraction of our thinking capacity is engaged. System 1 generates suggestions for System 2 such as impressions, intuitions, intentions, and feelings. If accepted by System 2, these impressions and intuitions turn into beliefs and impulses turn into voluntary actions. Thus, we normally believe our impressions and act accordingly. System 1 is usually very good at what it does, its models of situations and short term predictions are accurate, and its initial reactions are swift and generally appropriate. Such automatic assessments of radiation risks, however, may be far from appropriate for the circumstances. Since System 2 relies on sensory input to warn of dangers, and radiation provides no information for our senses, then System 2 has to rely on impressions from System 1. System 1 impressions may come from mythology perpetuated by the media and images of unacceptable consequences that could result from radiation exposures. Such impressions may have no relevance to technical reality as understood by specialists in radiation safety.

Since System 1 operates automatically and cannot be turned off, errors of intuition and impressions may be difficult to prevent. Biases cannot be avoided because System 1 has no clue to errors in radiation risk decisions. Even if cues to errors in response to radiation risks are evident, such errors can only be prevented by concentrated monitoring and significant effort by System 2. Thus, when a responder instinctively decides to run in response to a screaming Geiger counter, reversing that decision requires considerable effort on the part of System 2. Our conscious minds (System 2) are not intended to constantly monitor the decisions of System 1. System 2 is much too slow and inefficient for most routine decisions. Do we want to slowly analyze the potential of a striking snake before instinctively jumping back? In the mind of a first responder, running will seem like an appropriate response to a radiation signal.

This discussion of Systems 1 and 2 (subconscious vs conscious mind) will continue in a series of forthcoming Newsletters, including more notes from Kahneman's book.

[Forward email](#)



Try it FREE today.

This email was sent to reader@virtupro.biz by [greg@radiationcounseling.org](mailto:greg@radiationcounseling.org) |  
[Update Profile/Email Address](#) | Instant removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).

Radiation Safety Counseling Institute | c/o VirtuPRO Business Solutions | PO Box 6514 | Ocean Isle Beach | NC | 28469