



Radiation Safety Counseling News

How We Make Decisions for Radiation Safety and are Prone to Errors?

Dear Reader,

This month I continue to explore concepts from the book by Daniel Kahneman. These concepts can help us understand why we may make errors when making decisions for radiation safety.

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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Radiation Safety Counseling Services



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How We Make Decisions for Radiation Safety and are Prone to Errors?

This month we will continue to draw upon observations from a recent book by Daniel Kahneman (Nobel Prize in economics) "Thinking, Fast and Slow." Farrar, Straus, and Giroux, New York, 2011. Last month we looked at the function of our conscious and subconscious minds for making safety decisions. We learned that while we, as radiation safety professionals, may believe our decisions for radiation safety are logical, deliberate, and rational, that may not be the case. Any quick, spontaneous, decision about the safety of our radiation sources most likely comes from the subconscious mind, which Kahneman says is the secret author of most of our decisions for safety. Kahneman also describes many ways in which the subconscious mind is prone to errors when making decisions for safety, especially where the danger is not imminent, such as radiation.

The Functioning of Our Subconscious Mind and Cognitive Ease

Our subconscious mind is constantly scanning all information and sensory inputs to detect and predict dangers to be avoided. This process functions by quickly associating inputs with all previous experience and memories to predict what may be coming next. Since this process is automatic and outside of our awareness, it requires no conscious effort. Our subconscious is continuously updating answers to key questions. Is anything new happening now? Is there a threat? Are things going well? Should my attention be redirected? Is more conscious effort needed for some task at hand?

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.

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Kahneman says we experience cognitive ease when things are going well with no threats, nothing new is apparent, and no need to redirect attention or mobilize conscious effort. We experience cognitive strain when a problem or something new is detected which requires mobilization of conscious effort. The extent of the strain is related to the level of effort required and the presence of unmet demands. Cognitive ease is related to whether the experience is repeated and familiar, whether the input feels good and true, how we are primed for the input, and whether the information is clear. When we are in a state of cognitive ease we probably like what we see, believe what we hear, trust our intuitions, and feel the current situation is familiar. In this state we are likely to be relatively casual and superficial in our thinking. Under cognitive strain, however, we are likely to be more vigilant and suspicious and invest more effort in what we are doing.

Familiarity and Cognitive Ease

Words which we have seen before become easier to see and will give us a greater sense of familiarity and cognitive ease. This experience of familiarity can have a powerful quality of 'pastness' that seems to indicate a direct reflection of past experience. However, this quality of pastness is an illusion and may give an impression of familiarity simply because we have seen the same words before. For example, what happens in peoples' minds when they see or hear the words "deadly radiation?" Since the media has been reporting those words for more than 60 years, most people are unconsciously primed to hear those words as familiar and may lead to cognitive ease. Because of familiarity and cognitive ease, most people will not be inclined to evaluate the meaning of those words by conscious effort. Therefore those words carry an "illusion of truth." The conscious mind will then proceed on that impression without further questions or analysis.

Anything which makes it easier for the subconscious association process to run smoothly will bias beliefs. A reliable way to make people believe in something is frequent repetition. Because of cognitive ease, familiarity is not easily distinguished from truth. Authoritarian governments and marketers have always known this. However, more recently psychologists have discovered that you do not have to repeat the entire phrase or idea to make it appear true. Thus, people familiar with the words "deadly radiation" now only need to hear the word "radiation" to arrive at the same conclusion.

Judgments of Truth

Decisions are commonly based on cognitive ease. Our minds are designed to conserve energy. Therefore we tend to avoid efforts to judge information that requires logical analysis for evaluation and consciously takes energy. Psychologists tell us that we all live our lives guided by the impressions of our subconscious mind, even when we do not know the source of these impressions. We will judge a statement as true when we feel a sense of cognitive ease which comes when the words are familiar and linked by association to other beliefs or preferences which we hold, or come from a source we trust or like (the media). Unfortunately because of many factors which can contribute to cognitive ease (including priming and familiarity) it becomes very difficult to distinguish between cognitive ease and the truth. While it is possible for people to overcome some of the superficial factors that lead to cognitive ease and judgments of truth, it requires motivation and effort. Since our conscious mind is programmed to conserve energy it is more likely to adopt the impressions of the subconscious mind and march on.

The Mere Exposure Effect

Repetition induces a comforting feeling of familiarity and therefore cognitive ease. A study of words used in weekly ads showed that the words used most frequently were rated more favorably than words only used once or twice. The mere exposure effect does not depend on any conscious awareness of familiarity. The effect of repetition on liking is profoundly

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important to our survival. To survive in a dangerous world we have learned to react cautiously to a novel stimulus with withdrawal or fear. Because we have been primed with the words "deadly radiation" for so long these words are no longer novel. They are now familiar and do not lead to any conscious effort to determine their meaning. People do not expect to hear about radiation other than "deadly." Efforts to leave out or modify the word "deadly" may in fact invite suspicion because to do so would be novel in today's world.

Conclusions on Cognitive Ease

Studies show cognitive ease, intuition, creativity, gullibility, and increased reliance on the subconscious mind go together. On the other hand, suspicion, vigilance, an analytical approach, and increased effort also go together. When we experience cognitive ease we see the environment as normal which does not require extra vigilance or analysis. For most of the world, normal means "deadly radiation." Someone trying to tell us that radiation is not deadly is not normal.

Next month we will explore additional factors that contribute to errors in safety decisions.

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