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Why People Are Afraid of Nuclear Power

By David Ropeik

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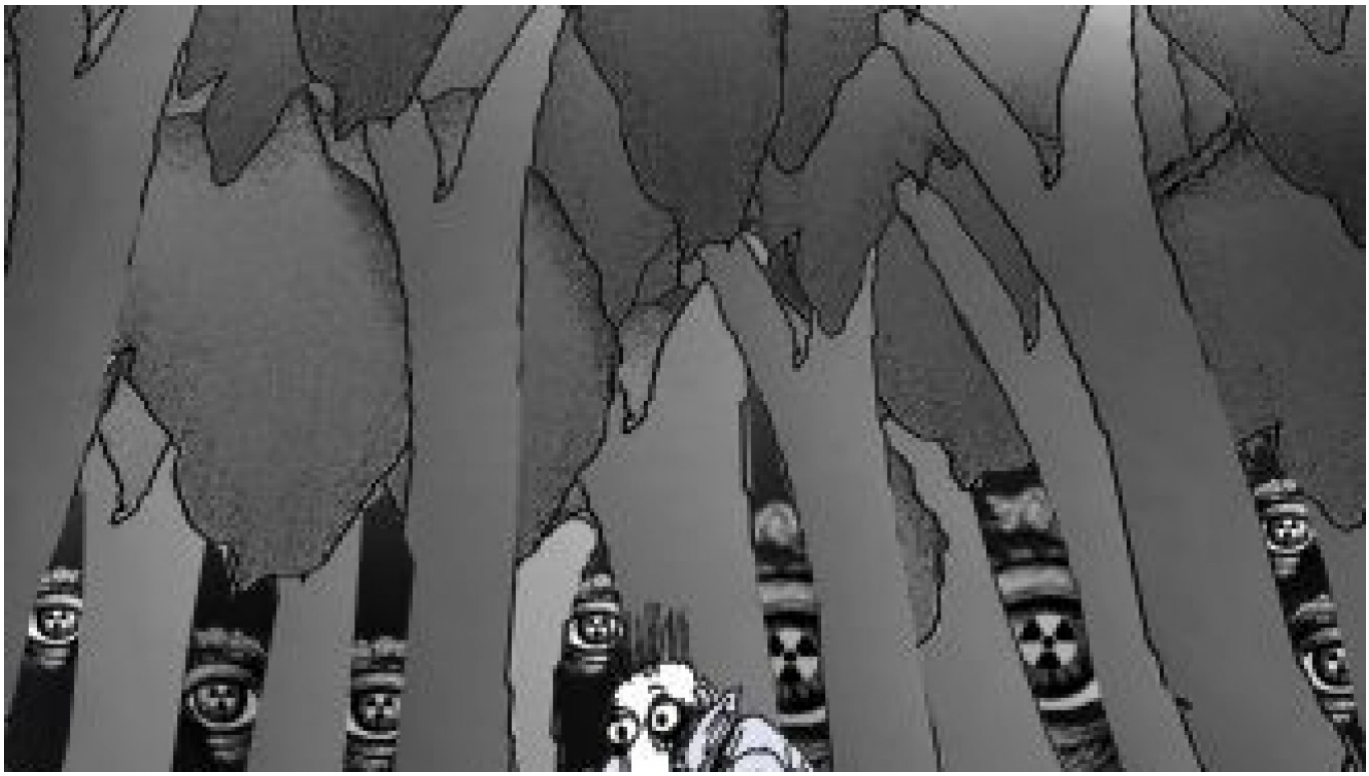

Germany's ambivalence about nuclear energy, common in many developed countries, has been on display again recently, following Chancellor Angela Merkel's decision to extend the operating life of the country's 17 nuclear plants for an average of 12 years beyond their currently scheduled closure dates. Merkel says this will help Germany develop the "most efficient and environmentally friendly energy supply worldwide." Opposition leaders say the government is "selling safety for money."

Both sides argue about the facts, but underlying that debate is an argument about how those facts feel. How risk is perceived — whether the risk is nuclear power or genetically modified food or any other potential threat — is never a purely rational, fact-based process.

Decades of research have found that risk perception is an affective combination of facts and fears, intellect and instinct, reason and gut reaction. It is an inescapably subjective process — one that has helped us survive, but that sometimes gets us into more trouble because we often worry too much about relatively smaller risks, or not enough about bigger ones, and make choices that feel right, but that actually create new risks.

So, as Germany grapples with the issue of nuclear power, there are important lessons to be learned, not only about nuclear power per se, but also about how we perceive risk in the first place, because understanding that subjective system is the first step toward avoiding its pitfalls.

Consider the two aspects of the risk of nuclear radiation: the facts and the feelings.

For 65 years, researchers have followed nearly 90,000 hibakusha, the name in Japan for atomic bomb survivors who were within three kilometers of the Hiroshima and Nagasaki explosions in 1945. Scientists compared them with an unexposed Japanese population to calculate the effects of the radiation to which they had been exposed. The current estimate is that just 572 hibakusha — a little more than 0.5 percent — have died, or will die, from various forms of radiation-induced cancer.

Research by the Radiation Effects Research Foundation found that the fetuses of hibakusha women who were pregnant at the time of the explosions were born with horrible defects. But the foundation found little other serious long-term damage — even genetic damage — from exposure to those extraordinarily high levels of radiation.

Relying on the Japanese research, the World Health Organization estimates that over the entire lifetime of the population of several hundred thousand people exposed to ionizing radiation from Chernobyl, as many as 4,000 might die prematurely from cancer caused by the leaked radiation. That is tragic, of course, but, like the number of cancer deaths among survivors of Hiroshima and Nagasaki, it is a smaller number than many people assume.

So, if ionizing radiation is a relatively weak carcinogen, why is nuclear power so scary? Research into how people perceive and respond to risk has identified several psychological characteristics that make nuclear radiation particularly frightening:

- It is undetectable by our senses, which makes us feel powerless to protect ourselves, and lack of control makes any risk scarier.
- Radiation causes cancer, a particularly painful outcome, and the more pain and suffering something causes, the more afraid of it we are likely to be.
- Radiation from nuclear power is human-made, and human-made risks evoke more fear than natural threats.
- Nuclear power plants can have accidents, and people are intrinsically more afraid of risks associated with a single large-scale “catastrophic” event than they are of risks that cause greater harm spread over space and time.
- Many people don’t trust the nuclear industry, or government nuclear regulators, and the less we trust, the more we fear.

Despite all these fears, public attitudes toward nuclear power are shifting. The psychology of risk perception explains that too:

- We are more aware of the benefits of carbon-dioxide-free emissions, and when the benefits of a choice seem larger, the associated risks seem smaller.
- The Chernobyl disaster in 1986 was fresher in European minds in 2000 — when Germany voted to eliminate all nuclear power by 2021 — than it is now, a decade later, and the less immediately aware of a risk we are, the less fear it induces.

These psychological factors have nothing to do with the facts about the actual risk of nuclear radiation. But as is often the case with risk perception, emotional filters, more than the facts, determine how afraid we are.

We must recognize that our response to risk can pose a danger all by itself. Our fear of nuclear power has led to energy economics that favor coal and oil for electricity, at great cost to human and environmental health. Particulate pollution from fossil fuels kills tens of thousands of Europeans every year, and CO2 emissions fuel a potentially calamitous shift in global climate.

No amount of education or good communication can get around this. Subjective risk perception is hard-wired into our architecture and chemistry. What governments can do is to learn what psychological research has established: Our perceptions, as much as they must be respected in a democracy, can create their own perils.

With that understanding, government risk assessment can account not only for the facts, but also for how we feel about them and how we behave. That way, we can reduce conflict over nuclear power and foster wiser and more productive policies for public and environmental health.

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