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The perception gap: An explanation for why people maintain irrational fears

By David Ropeik | February 3, 2011

A number of wonderful books decry the public's seemingly irrational perceptions of risk. Seth Mnookin's *The Panic Virus* is the latest, and builds on Michael Specter's *Denialism* and Chris Mooney's *Unscientific America*. Strong as each book is, unfortunately none get to the heart of the matter, and describes not how we feel, but WHY. Why are some people too afraid of vaccines, or fluoride, or radiation from cell phones, or all the other modern bogeymen that science says aren't all that dangerous? And why aren't we *more* afraid of climate change or obesity or antibiotic resistant bacteria, or other perils that science has identified as huge imminent threats?

These books wisely observe the dangers that result when we are more afraid than the evidence warrants, or not afraid enough when the evidence screams "Beware." But to mitigate those dangers and close that Gap, we need to do more than just observe and lament that our fears don't match the facts. We need to understand why we make these mistakes, and why these misperceptions arise. We need to understand the roots of risk perception if we want to figure out how to reduce the risk of what I call (in *How Risky Is it, Really? Why Our Fears Don't Always Match the Facts*) The Perception Gap.

Each author takes a shot at this, but falls short. They rightly heap blame on the media, and poor risk communication by government and the scientific community, and there is even a bit of recognition of cognitive biases. Accurate as all that is, the body of evidence that helps explain the psychology of risk perception is far richer, and offers much more detailed explanations for *why* our fears so often don't seem to match the facts. Here is just some of the research relative to the fear of vaccines.

Most importantly, risk perception is not, and can never be, purely rational. Risk can be measured and studied and factually described, but no matter what those facts say, our *perception* of those facts is intrinsically subjective. We subconsciously apply psychological and instinctive filters that help us quickly determine if that information might suggest danger, well before we have all the facts, forming the critical first judgment about how to stay safe, against which we interpret everything that follows. That helps explain why it doesn't matter if Wakefield is debunked. It's very hard to unwire the neural connections that represent our first assessment of how to protect ourselves. This system is rooted in the architecture and chemistry of the brain's 'fear' systems. We are hard wired to respond to risk with a *mix* of facts *and* feelings.

And then there is four decades of research from psychology, which has revealed a common set of affective/emotional characteristics that make some risks feel scarier than others, the facts notwithstanding. Several help explain why some people are excessively afraid of vaccines;

* Uncertainty. When we are uncertain, as are parents with autistic kids, we grab on to anything that answers our questions, because that *sense of knowing* affords us a reassuring feeling of control. Control is vital to anyone who is afraid, worried, uncertain.

* Trust. When authority dismisses our fears, our trust in authority goes down and our resistance to it goes up. The parents of autistic kids were dissed by the establishment. By the governments that were supposed to keep them and their kids safe. By doctors. By science. The parents were called irrational, emotional, ignorant. That badly damaged trust, and when trust goes down, resistance to factual information from untrusted goes up.

* Choice. A risk imposed on us feels scarier than when we choose to take it ourselves. To many opponents vaccination feels involuntary

though there are opt outs. As Barbara Loe Fisher, opponent of vaccination, said "The battle we are waging will determine what both health and freedom will look like in America." *Freedom? Vaccines as a Tea Party issue?* Yes, because of the psychological importance of choice.

* Human-made or Natural. Vaccines are human-made (though of course they are just manufactured versions of natural substances), and human-made risks scare us more than natural ones. A mother in a recent documentary on vaccination said she is less afraid of measles for her child "...because it's natural."

* Risks versus Benefits. Fear of vaccines goes up as fear of the diseases they have all but eliminated (*ergo* the benefit of the vaccines) goes down. But where vaccination rates are so low that measles and whooping cough are coming back, the fear of those diseases is rising and pushing back against those who opt out of vaccination. This is a great example of how the same risk can lead to different perceptions not based just on the facts, but how we feel about the risks and benefits, the tradeoffs.

This is way more than an alarmist media or poor risk communication by government or poor science education in schools. The real reason why our fears sometimes don't match the facts, about vaccines or any risk, is the primal emotional/instinctive psychology that helps us survive. Given the power of that imperative it's small wonder that our perceptions of risk, informed by these instincts, are so fiercely held, and so deeply resistant to reason.

As powerful as this psychology is, and as deeply a part of being human as it is, describing it as right or wrong, rational or irrational, ignores (or arrogantly denies) the inescapable reality of the complex imperfect affective way humans perceive and respond to danger. Calling people who do this dumb is dumb. Instead, we need to accept that we will always be at risk from The Perception Gap. It is just part of who we are. Rather than lament it and try and fight it in the naive pursuit of perfect rationality, we need to use what we've learned about risk perception to manage the risk of our misperceptions, with policies and regulations and incentives and communication and education campaigns, that help us deal with this danger just as we already do so many other physical threats. We have to go beyond just observing that we get risk wrong, and use our knowledge of why, if we want to do a better job of getting risk right.

Some interesting reading:

* On the neuroscience of fear, the *Emotional Brain*, Joseph LeDoux

* On the intrinsically affective nature of our perceptions, *Descartes Error*, Antonio D'Amasio

* For more of the "Fear Factors" that make some risks feel scarier than others, Chapter Three of *How Risky Is It Really?* available free at http://www.dropeik.com/how_excerpt.html.

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The views expressed are those of the author and are not necessarily those of Scientific American.