

# Profile of Paul Slovic

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On September 2, 2015, the image of three-year-old Syrian boy, Aylan Kurdi, lying face down on a Turkish beach sparked an international effort to aid refugees. Donations to charitable organizations surged, dwarfing the assistance to refugees since the violence in Syria began in 2011. Kurdi, however, was not the only person to drown that day in the Aegean Sea: Both his five-year-old brother and his mother died, as did several others.

According to research by psychologist Paul Slovic, the international response would have been less charitable had the public seen the other drowned refugees. "If we had seen just one more individual, our compassion toward them all might have faded," he explains. "Several psychological phenomena, including psychic numbing, would have made us care less about their plight."

Slovic, who was elected to the National Academy of Sciences in 2016, studies human decision making and motivation. His Inaugural Article dissects the response to Kurdi's death, enumerating the psychological obstacles to the human ability to care about mass atrocities. The article by Slovic et al. (1) also outlines techniques that can help face humanitarian crises without having to rely solely on compassion. A professor of psychology at the University of Oregon since 1986, Slovic also serves as the president of Decision Research, an institute that he helped found.

## From Basketball to Gambles

Born in Chicago in 1938, Slovic had a peripatetic childhood. His family traveled across the Midwest (Illinois, Wisconsin, and Minnesota) with his salesman father. Slovic was drawn to basketball, and he received a scholarship to attend Chicago's Depaul University. College basketball, however, proved challenging, and soon Slovic transferred to Stanford University. He credits psychologists Quinn McNemar and Lewis Goldberg with introducing him to psychological research methods and encouraging him to further his studies. Slovic received an undergraduate degree in psychology in 1959, and decided to pursue a doctorate in the subject. "Goldberg advised me to go to the University of Michigan, where he had just received his PhD," he adds.

At Michigan, Slovic found a mentor in Clyde Coombs, a pioneer in mathematical psychology and



Paul Slovic. Image courtesy of Paul Slovic.

psychometrics. Under Coombs, Slovic used gambles to understand how people make decisions. Slovic says a gamble "has elements that represent the risks of all kinds of activities in life that have probabilities of gaining or losing something. Although the nature of the gambles and my research focus has changed dramatically, understanding how we react to gambles," Slovic says, "in one way or another has been the cornerstone of my work since my PhD."

## Constructing Preference

After receiving his doctorate in 1964, Slovic returned to the West Coast, where he joined his undergraduate mentor Goldberg at the Oregon Research Institute. In 1976, after the institute temporarily disbanded, Slovic and two other colleagues started Decision Research, where he has been ever since. "For 52 years, I've been in Eugene, Oregon at these two institutes, having the good fortune to be able to pursue my interests," he adds. During this time, his research methods also evolved, from paper and pencil studies with undergraduate students, to small telephone interviews

This is a Profile of a recently elected member of the National Academy of Sciences to accompany the member's Inaugural Article on page 640 in issue 4 of volume 114.

and, finally to widespread Internet experiments. "Despite the approach, we always try to look for convergences between our experiments and real life."

As his work evolved, Slovic integrated methods from other judgment areas to investigate how individuals weigh and combine items of information. With psychologist Sarah Lichtenstein, he asked people to evaluate the attractiveness of gambles in two ways: by putting prices on them and by choosing which ones they preferred to play. The researchers discovered that if given a choice, many people preferred a gamble that had a higher chance of winning (a 70% chance to win \$10, for example) over a long shot with a greater payout. However, many of these same individuals would pay more to play the long shot (2).

Slovic's work increasingly put him at odds with economists, who also study decision making. "Economic theory said that people have well-defined preferences and that those preferences are consistent," he says. "They never had a sense that preferences would systematically reverse as a result of logically equivalent ways of eliciting them."

This research had dramatic implications across many domains of decision making. "It caused a lot of problems," Slovic reveals. "If people weren't the rational actors that economists thought they were, then they could be manipulated by contextual factors that really shouldn't matter."

With Lichtenstein, Slovic developed the concept of context dependency into a broader notion of preference construction, which describes the instability of tradeoffs when reaching a decision. "When shopping for a car, for example, we may say that we highly value both safety and cost. Those are stable objectives, and we know that we want both. But the strategies we employ to resolve conflicts between objectives are not always stable. This leaves us open to changes and reversals, depending on the way the alternatives are described or how our preferences are expressed." Thirty-five years after they first revealed the malleability of preference using gambles, Lichtenstein and Slovic edited a book on the subject that, by then, had expanded into fields as diverse as law, marketing, medicine, finance, philosophy, and environmental policy (3).

### Risks of Life

An encounter with prominent geographer Gilbert White also expanded the focus of Slovic's work. White, who was one of the first people to study public perceptions of risk, asked the psychologist why, after natural disasters like hurricanes, floods, or earthquakes, people return to rebuild and face the risk again. "Well, I hadn't studied that as a gamble!" Slovic replied.

As a result of this encounter, Slovic, with Lichtenstein and psychologist Baruch Fischhoff, began inquiries into perception of risk from "society's gambles." In America in the 1960s and 1970s, with the propagation of nuclear power and the increased public awareness of carcinogens due to environmentalist Rachel Carson's

influential book, *Silent Spring*, risk assessment was a growing field. However, it was still a domain without a psychological component.

"Using nuclear power as an example," Slovic adds, "engineers would develop probabilistic risk assessments for different adverse consequences. This led them to judge nuclear power as acceptably safe, in contrast to growing public concern about its risk."

By examining the social and psychological factors of risk, Slovic and his colleagues broadened the discipline of risk analysis. Their studies showed that people are sensitive to qualities of hazardousness (involuntary exposure, controllability, scientific uncertainty, catastrophic potential, dreadfulness, risk to future generations, and inequity) that are often omitted from technical assessments (4). The work of Slovic, Lichtenstein, and Fischhoff influenced a 1996 report on risk from the National Research Council entitled *Understanding Risk: Informing Decisions in a Democratic Society*. (5).

### Feeling Risky

Further investigations detailed the complex interaction between fast, intuitive feelings and slower, deliberate reasoning when people make judgments. Slovic drew on the work of Nobel Prize-winning psychologist Daniel Kahneman and others who demonstrated that people typically rely on feelings rather than deliberation (6). The "feeling of risk" plays a critical role in risk perception. As an example, Slovic notes that "across different hazards, risk and benefit are typically positively related: Activities that carry high risk sometimes can have very high benefit." Our intuitive judgments, however, fail to reflect this relationship. Instead, when we rely on our feelings, risk and benefit appear inversely related. "If we like an activity, we judge it to have high benefit and low risk. If we dislike it, we judge the benefits to be low and the risks high." Slovic calls this reliance on feelings the affect heuristic (7).

### Illusion of Inefficacy

Feelings also provide people with a value system: one that is more sensitive to the need to help individuals than to help large numbers of people. "Through the course of evolution, we relied on our feelings for survival," Slovic says, "and those were attuned to protecting ourselves and the small numbers of people right in front of our faces." This instinct, called psychic numbing, may be why human reactions are often inversely proportionate to suffering or why people react more strongly to individuals in harm's way than to larger numbers at risk (8).

Particularly troubling to Slovic is that despite international pledges to intervene after the Holocaust, genocides and other mass atrocities have continued throughout the 20th and 21st centuries. "I started to study the psychological obstacles that inhibit life-saving interventions and, in addition to psychic numbing, we observed the problem of pseudoinefficacy," he says (9). This concept describes the demotivating feeling that any intervention, despite doing some good, simply would not be enough. According to Slovic, "when we

offered people the opportunity to help a child who's starving, and we showed a picture of the child and information about her, we got a fairly strong response. But when we showed that same child and then, next to her picture, we gave the statistics of the larger problem of starvation, suddenly the donations dropped in half. Apparently, it no longer feels as good to help this child when you are made aware of the many you are not helping." (10)

Slovic's work has dire implications and raises challenging questions: If people care too little about

multitudes, then how can the many vexing issues of genocide, refugees, starvation, disease, and poverty be solved? "I hope that by creating an awareness of the flaws in what we call the arithmetic of compassion, we can guard against being lulled to sleep by the numbers and understand the realities behind them," Slovic says (11). He also advocates for the creation of strong laws and institutions as a bulwark against atrocities. "We need mechanisms designed through slow—not fast—thinking to address our major problems."

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