

ON HUMAN NATURE

Melvin Konner



RISK AND HAZARD

Neil Jenney, *Risk and Hazard*, 1969

Why the Reckless Survive

You'd think that most people have heard by now that half of the twenty thousand auto passengers killed in U.S. traffic accidents last year would still be alive if only they had buckled their seat belts. Yet, when left to our own devices, most of us persist in driving without them. In Georgia, for example, where the sole reason for buckling up is to avoid having your skull shattered, only two drivers in ten take the trouble. In Texas, on the other hand, where failure to wear a seat belt can cost you not only your life but also fifty dollars, nearly seven people in ten wear them habitually. There is little doubt that the fine—imposed under a strictly enforced law—is what's working the magic: seat belt use has grown by nearly five hundred percent in Texas since the measure was adopted, in 1985.

That people's priorities could be so skewed may shock us, but it shouldn't; few of us are rational in the way we think about risk. It's not just that we're reckless; indeed, we tend to be highly sensitive to *some* dangers. A Harris poll conducted in 1980 showed that Americans worry a great deal about crime, political unrest, power plant accidents, and "the chemicals we use." Accordingly, we are often willing to spend huge sums to reduce the risk of a nuclear mishap or to decrease the odds that anyone will develop cancer from exposure to a particular contaminant. And a few dramatic terrorist incidents can persuade millions of us to forgo overseas travel for a time.

This is the same American public that, lacking legal inducement, wears seat belts at the paltry rate of about twenty

percent. It is the same public that has reduced its cigarette consumption only slightly in recent years, despite compelling evidence that smoking kills about a thousand people—or three jumbo-jetfuls—every day. And it is the same public that spends billions of hard-earned dollars on public lotteries, when the odds of striking it rich are somewhat slimmer than those of being struck dead by lightning. In short, we often worry obsessively about vague and distant dangers while blithely ignoring clear and present ones.

This presents a real conundrum. One would expect natural selection to penalize such silliness and, eventually, to produce organisms that efficiently avoid risk and thus enhance their survival. How could evolution, with its supposed relentless winnowing out of inefficiency, have

preserved this bewildering array of sloppy habits? Is it simply the heedless child in us, saying "I will do as I please, thank you"? Or is there something ultimately sensible, even good, about the taking of all these chances?

Risk assessment isn't the only mental exercise humans perform poorly; irrationality seems to pervade all our decision making. The classic theory of economic behavior, known as subjective expected utility, assumes that individuals approach all decisions with full knowledge of the possible outcomes and that we weigh the available alternatives on an unambiguous scale of value. But a few economic theorists, including Herbert Simon, of Carnegie Mellon, have long known better. Our grasp of a given situation is always imperfect, Simon has argued, and the values that inform our decisions are often vague and mercurial.

Psychologists have demonstrated as much. Amos Tversky, of Stanford University, and Daniel Kahneman, of the University of British Columbia, have shown, for example, that perfectly intelligent people are easily swayed by the way a problem is "framed." In one study, Tversky and Kahneman asked physicians to choose among possible programs to combat a hypothetical disease that was on the verge of killing six hundred people. The physicians favored a program guaranteed to save *two hundred lives* over one that had a one-third probability of saving everyone and a two-thirds chance of saving no one. Yet a second group of physicians favored the riskier program over one described as resulting in *exactly four hundred deaths*. They were, of course, rejecting the same alternative the previous group had chosen. The only difference was that it was now being described in terms of victims rather than survivors, loss instead of gain. Human decision making is rife with such framing errors, and analyzing them has become a cottage industry.

But not every departure from pure statistical rationality can really be termed an error. You can prove that a lottery player is irrational by multiplying the prize amount by the probability of winning, then comparing that number with the cost of the ticket. That, however, does not take into account the thrill of playing, the subjective value placed on great wealth, or that this may be the player's only chance to attain it. Still, most people who buy lottery tickets make at least one judgmental error: they harbor unrealistically high expectations of winning.

The same holds true in the larger game of life. Psychologists have shown that most people think they will have better-than-average health, live longer-than-average lives, and enjoy more-durable-than-average marriages. But, since aver-

age people are likely to have average rates of death, disease, and divorce, they are clearly underestimating their risks. Such unwarranted optimism is consistent with our fearlessness about cigarettes and automobiles, but it doesn't seem to fit with our skittishness about muggers and meltdowns.

Not at first, anyway. John Urquhart and Klaus Heilmann, in their book *Risk Watch: The Odds of Life*, show that our courage and cowardice are, in an odd way, congruent. To identify the rules by which we misjudge various risks, Urquhart and Heilmann gauged the *actual* danger inherent in different activities, using a "safety-degree scale" analogous to the Richter scale for earthquake severity. The scale's units are logarithms of the number of people typically exposed to a given hazard before one death occurs. Thus, lightning, which kills fewer than one person for every million exposed, has a safety degree of more than six, whereas motorcycling, which kills one in a thousand, rates only a three: motorcycling is more dangerous by three orders of magnitude.

But the two risks aren't perceived in that ratio. Just as Urquhart and Heilmann have ranked actual risks, Paul Slovic and his colleagues at Decision Research, in Eugene, Oregon, have measured people's perceptions of some of the same hazards. Perception, it turns out, often has little to do with reality. Moreover, our departures from reality are not random; they follow three basic principles.

First, people prefer voluntary risks to involuntary ones; we will generally accept one to two orders of magnitude more danger in matters we feel we can control than in matters we know we can't. We imagine ourselves—because of good genes or future medical advances or just dumb luck—immune to the depredations of cigarette smoke or saturated fat. And we trust our wits to keep us safely astride our bicycles, despite the odds that we'll end up in a spill. Street criminals, lightning bolts, and nuclear-power plants, though far less likely to kill us, loom large because encounters with them are forced on us.

Second, we are more comfortable with familiar hazards than with exotic or dramatic ones. Certain outcomes—the slaughter of innocents aboard a hijacked airliner, an explosion at a chemical plant—naturally dominate our attention (and the media's) despite their relative infrequency, or rather because of it. Quieter killers, such as heart disease, may take more lives, but their effect on the imagination is diminished by their routine nature.

And third, deaths that occur in bunches are more frightening than those that come in a steady trickle, regardless of the totals. Fewer than a tenth as many Americans die in tornadoes each year as die by elec-

trocution. Yet, as Slovic has shown, people perceive the two dangers as being about equal.

That any organism would so consistently misconstrue the dangers it encounters may seem to fly in the face of evolutionary logic. But the mystery runs deeper still, for while most people may be irrational when it comes to risk, some seem positively antirrational. Most people leave their seat belts unbuckled, but a few insist on racing motorcycles, jumping out of airplanes, or scaling cliffs with their fingernails. Most people, at one time or another, succumb to lotteries, friendly poker, or church bingo, but an estimated one million to four million Americans are relentlessly destroying their lives, and the lives of those close to them, by gambling compulsively. Psychologists have only begun to address these individual differences, but several lines of research suggest there is such a thing as a risk-taking, or sensation-seeking, personality.

The bulk of the evidence has been amassed by psychologist Marvin Zuckerman, of the University of Delaware, who uses a questionnaire known as the "sensation-seeking scale" to measure four related aspects of this predilection. They are "thrill and adventure seeking," the propensity for physical risk taking, as in skydiving or mountain climbing; "experience seeking," a wider disposition to try new things in, say, art, music, travel, or friendship; "disinhibition," the hedonistic pursuit of pleasure through such activities as sex, drinking, or gambling; and "boredom susceptibility," an aversion to routine work and staid, unadventurous people.

In numerous studies in the United States and England, investigators have found that males consistently score higher than females and that sensation seeking tends to decline in both sexes with age. There is even evidence of a genetic basis for some of the variation among individuals. One study found that the scores of identical twins were far more closely matched (with a correlation of 0.60) than were those of nonidentical twins (0.21).

Sensation seeking, as measured by the questionnaire, has a number of interesting physiological correlates. When exposed to some novel stimulus, such as a light flash, people with high sensation-seeking scores exhibit changes in heart rate and skin conductance that are somewhat different from those seen in low scorers. Moreover, the brain wave patterns of sensation seekers indicate a greater receptivity to increases in the intensity of stimulation. Another physiological correlate involves the activity of monoamine oxidase (MAO), an enzyme that breaks down certain neurotransmit-

ters (the chemicals that transmit signals between brain cells). Sensation seekers have less MAO activity than do non-seekers, suggesting that the stimulating effect of neurotransmitters might persist longer in their brains. Finally, sensation seekers have higher levels of testosterone and estrogen—hormones associated with sexual and aggressive behavior.

High scorers also share certain patterns of behavior. Zuckerman's surveys suggest that they are more promiscuous than low scorers; consume more drugs, alcohol, and cigarettes; volunteer more often for experiments and other unusual activities; gamble more; and court more physical danger. Sensation seeking also correlates with hypomania and, in the realm of the criminal, with psychopathy. Studies by Frank Farley, of the University of Wisconsin at Madison, have confirmed and extended these findings. In prison populations, for example, Farley has found that escape attempts and fighting are more common among inmates with "thrill-seeking" tendencies.

What, in an evolutionary sense, could possibly account for these strange patterns of behavior? Why do we tend to be so reckless about familiar and voluntary risks, yet so fearful of the unknown and the catastrophic? Where did we come by our unwarranted optimism and—more puzzling—why are some of us biologically predisposed to court mortal danger?

Some of our reckless ways are easily attributed to specific evolutionary motives. Kristin Luker, for example, a sociologist at the University of California at San Diego, analyzed the lax use of contraceptives by couples trying to avoid pregnancy and uncovered what often seemed an unconscious desire for a baby. It is no challenge to reconcile this with evolutionary theory; a Darwinian couple *ought* to take such risks right and left. Sexual indiscretions in general could be explained by a similar line of argument, for the impulse that causes indiscretions also tends to perpetuate genes. By the same token, many of our culinary vices would be unmitigated virtues if starvation were a constant threat. We overdo it on fats and sweets because our ancestors were rewarded for such excesses with insulation to carry them through shortages. Death by atherosclerosis may be a pervasive threat today, but for most of the past three million years it was a consummation devoutly to be wished.

Even our propensity for willful recklessness becomes less puzzling when placed in an evolutionary context. Martin Daly and Margo Wilson, both psychologists at McMaster University, in Ontario, demonstrate in a forthcoming book about homicide that risky behavior can have evolutionary advantages. They simulated

by computer a series of fights in which individuals with different risk propensities—low, medium, and high—encountered one another. A given risk of death was assigned for each fight and the outcome for each character type examined. The high-risk individuals, because they engaged in more fighting, inevitably suffered the highest mortality rates. But, as a group, they also won the most fights. In Darwinian terms, such high-risk takers should enjoy the greatest access to food and mates. And when this is the case, the long-term result is a predominance of high- or medium-risk individuals in the population. They take the biggest chances, but they leave more genes.

In real life, the quarrels that end in homicide often stem from trivial insults or disagreements. But these conflicts are never *really* trivial. They involve status and honor, which in practical terms means whether and how much you can be pushed around. On this will depend your access to food, land, and women (the combatants are nearly always males)—in short, most of what matters in life and natural selection. In societies in which heads are hunted or coups counted, the process is more formalized but the principle is similar; nothing ventured, nothing gained.

This principle might not hold in an ideal world; risk takers would have too much to lose and too little to gain. But the environments of our ancestors were far from ideal. Given an average life expectancy of thirty years, and the constant threat of dying from disease, they had little reason to play it safe or to base decisions on considerations about the future. To do so would have been absurd: they could not presume to *have* a future. As studies of Mexico's "culture of poverty" and of poor black street-corner men make clear, there still are individuals for whom a gamble is simply an opportunity.

It is important to bear in mind that to die is not, in Darwinian terms, to lose the game; students of animal behavior have long known that individuals sometimes enhance their "inclusive fitness"—the survival of their genes—by risking or sacrificing their lives for their kin. If, by dying, I save a brother or a daughter, my genes may be perpetuated through these relatives. Sacrifice for offspring is common in the animal world, but great risks are taken and sacrifices made for other relatives, as well. Consider that worker honeybees eviscerate themselves to protect the colony from intruders and that many animals (birds and ground squirrels, for example) risk calling predators' attention to themselves when they sound alarm calls for their cohorts. During our own evolution, small kin-based groups might have gained much from having a

minority of reckless sensation seekers in their ranks—people who wouldn't hesitate to snatch a child from a pack of wild dogs or to fight an approaching grass fire with a counterfire.

In any case, both sensation seekers and people in general should have taken their risks selectively. They may actually have benefited from taking big risks with the seemingly controllable and familiar, even while exaggerating the risk of the unknown. It is, after all, difficult to imagine a successful, active encounter with a large, inscrutable force; given a volcano or a hungry lion, an early human would have had a far better chance of subduing or outwitting the lion. So our ancestors reserved their deepest fears for "acts of God," cloaking them in taboo and ritual, even while betting dangerously on themselves in situations in which individual competence could seem to make a difference. And we, their descendants, cancel our trips to Europe but leave our seat belts unbuckled.

Ideally, of course, one would want a human organism that took risks that enhance fitness and avoided those that don't. But life is not that simple. The result of the long evolutionary balancing act is a most imperfect organism: you probably can't be the sort of person who maintains perfectly safe and healthy habits, and at the same time reflexively take the risks needed to ensure survival and reproductive success in anything like the original human environment. If you are designed, emotionally, for survival and reproduction, then you are not designed for perfect safety.

When my father buckles his seat belt behind him, and my brother ignores the surgeon general's urgent advice about smoking, it isn't because, or only because, they underestimate the risks. My father wants the full sense of competence and freedom that driving has given him since long before seat belts were dreamed of. My brother wants the satisfaction that comes out of puffing the cigarette. And they both want the risk that goes with it, because risk taking is part of being alive. For many of us, life seems compromised by the endless calculation of possible risks. Such calculation carries a cost—in attention, in inhibition, in self-image, in fun. And the fun is not incidental. It is evolution's way of reminding us of what we were designed for. ●

MELVIN KONNER, who teaches anthropology at Emory University, in Atlanta, is currently a fellow at the Center for Advanced Study in the Behavioral Sciences, in Stanford. His book *BECOMING A DOCTOR: A JOURNEY OF INITIATION IN MEDICAL SCHOOL* will be published by Viking in August.