

## BOOK

*The Undoing Project: A Friendship that Changed our Minds*

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## SYNOPSIS [FROM THE COVER]

Forty years ago, Israeli psychologists Daniel Kahneman and Amos Tversky wrote a series of breathtakingly original papers that invented the field of behavioral economics. One of the greatest partnerships in the history of science, Kahneman and Tversky's extraordinary friendship incited a revolution in Big Data studies, advanced evidence-based medicine, led to a new approach to government regulation, and made much of Michael Lewis's own work possible. In *The Undoing Project*, Lewis shows how their Nobel Prize-winning theory of the mind altered our perception of reality

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"The writer Nate Silver for several years enjoyed breathtaking success predicting election outcomes for the New York Times, using an approach to statistics he learned writing about baseball. For the first time in memory, a newspaper seemed to have an edge in calling elections. But then Silver left the Times, and failed to predict the rise of Donald Trump – and his data-driven approach to predicting elections was called into question . . . by the New York Times! "Nothing exceeds the value of shoe-leather reporting, given that politics is an essentially human endeavor and therefore can defy prediction and reason," wrote a Times columnist, late in the spring of 2016. (Never mind that few shoe-leather reporters saw Trump coming, either, or that Silver later admitted that, because Trump seemed *sui generis*, he'd allowed an unusual amount of subjectivity to creep into his forecasts.)"

"Ten years of grilling extremely tall people had reinforced in Daryl Morey, the general manager of the Houston Rockets, the sense that he should resist the power of any face-to-face interaction with some other person to influence his judgment. Job interviews were magic shows. He needed to fight whatever he felt during them – especially if he and everyone else in the room felt charmed. Extremely tall people had an unusual capacity to charm. "There's a lot of charming bigs," said Morey. "I don't know if it's like the fat kid on the playground or what." The trouble wasn't the charm but what the charm might mask: addictions, personality disorders, injuries, a deep disinterest in hard work."

"The closest he came to certainty was in his approach to making decisions. He never simply went with his first thought. He suggested a new definition of the nerd: a person who knows his own mind well enough to mistrust it."

"Knowledge is literally prediction," said Morey. "Knowledge is anything that increases your ability to predict the outcome. Literally everything you do you're trying to predict the right thing. Most people just do it subconsciously."

"The Rockets collected data on basketball players that hadn't ever been collected before, and not just basketball data. They gathered information on the players' lives and looked for patterns in it. Did it help a player to have two parents in his life? Was it an advantage to be left-handed? Did players with strong college coaches tend to do better in the NBA? Did it help if a player had a former NBA player in his lineage? Did it matter if he had transferred from junior college? If his college coach played zone defense? If he had played multiple positions in college? Did it matter how much weight a player could bench-press?"

"Confirmation bias," he'd heard this called. The human mind was just bad at seeing things it did not expect to see, and a bit too eager to see what it expected to see.

"At the start of the first class, the professor asked him and everyone else in the class to write down the last two digits of their cell phone on a sheet of paper. Then she asked the class to write down their best estimate of the number of African countries in the United Nations. Then she collected all the papers and showed them that the people whose cell phone numbers were higher offered systematically higher estimates of African countries in the United Nations. Then she took another example and said, "I'm going to do it again. I'm about to anchor you. Here. See if you aren't screwed up." Everyone had been warned; everyone's minds remained screwed up. Simply knowing about a bias wasn't sufficient to overcome it."

"Why had so much conventional wisdom been bull\*\*\*\*? And not just in sports but across the whole society. Why had so many industries been ripe for disruption? Why was there so much to be undone? It was curious, when you thought about it, that such a putatively competitive market as a market for highly paid athletes could be so inefficient in the first place. It was strange that when people bothered to measure what happened on the court, they had measured the wrong things so happily for so long. It was bizarre that it was even possible for a total outsider to walk into the game with an entirely new approach to valuing basketball players and see his approach adopted by much of the industry."

"[Kahneman] was destined to become one of the world's most influential psychologists, and a spectacularly original connoisseur of human error. His work would explore, among other things, the role of memory in human judgment. How, for instance, the French army's memory of Germany's military strategy in the last war might lead them to misjudge that strategy in a new war. How a man's memory of German behavior in one war might lead him to misjudge Germans' intentions during the next. Or how the memory of a little boy back in Germany might prevent a member of Hitler's SS, trained to spot Jews, from seeing that the little boy he has picked up in his arms from the streets of Paris is a Jew."

"He'd always sensed that he would be some sort of professor, and the questions he had about human beings were more interesting to him than any others. "My interest in psychology was as a way to do philosophy," he said. "To understand the world by understanding why people, especially me, see it as they do. By then the question of whether God exists left me cold. But the question of why people believe God exists I found really fascinating. I was not really interested in right and wrong. But I was very interested in indignation. Now that's a psychologist!"

"The dominant school of thought was called behaviorism. Its king, B. F. Skinner, had gotten his start during the Second World War, after the U.S. Air Force hired him to train pigeons to guide bombs. Skinner taught his pigeons to peck in the right spot on an aerial map of the target, by rewarding them with food each time they did it. (They did this with less enthusiasm when antiaircraft fire was exploding around them, and so were never used in combat.) Skinner's success with the pigeons was the start of a spectacularly influential career underpinned by the idea that all animal behavior was driven not by thoughts and feelings but by external rewards and punishments."

"The central question posed by Gestalt psychologists was the question the behaviorists had elected to ignore: How does the brain create meaning? How does it turn the fragments collected by the senses into a coherent picture of reality? Why does that picture so often seem to be imposed by the mind upon the world around it, rather than by the world upon the mind? How does a person turn the shards of memory into a coherent life story? Why does a person's understanding of what he sees change with the context in which he sees it? Why – to speak a bit loosely – when a regime bent on the destruction of the Jews rises to power in Europe, do some Jews see it for what it is, and flee, and others stay to be slaughtered?"

"Later, when he was a university professor, Danny would tell students, "When someone says something, don't ask yourself if it is true. Ask what it might be true of." That was his intellectual instinct, his natural first step to the mental hoop: to take whatever someone had just said to him and try not to tear it down but to make sense of it."

Occasionally, people who watched Amos [Tversky] in action sensed that he was more afraid of being thought unmanly than he was actually brave. "He was always very gung ho," recalled Uri Shamir. "I thought it was maybe compensation for being thin and weak and pale." At some point it didn't matter: He compelled himself to be brave until bravery became a habit.

“Physically [Amos] was unremarkable. In a room full of thirty people he’d be the last one you’d notice. And then he’d start to talk. Everyone who ever met him thought he was the smartest person they had ever met.” The University of Michigan psychologist Dick Nisbett, after he’d met Amos, designed a one-line intelligence test: The sooner you figure out that Amos is smarter than you are, the smarter you are.”

“By changing the context in which two things are compared, you submerge certain features and force others to the surface. “It is generally assumed that classifications are determined by similarities among the objects,” wrote Amos, before offering up an opposing view: that “the similarity of objects is modified by the manner in which they are classified. Thus, similarity has two faces: causal and derivative. It serves as a basis for the classification of objects, but is also influenced by the adopted classification.” A banana and an apple seem more similar than they otherwise would because we’ve agreed to call them both fruit. Things are grouped together for a reason, but, once they are grouped, their grouping causes them to seem more like each other than they otherwise would. That is, the mere act of classification reinforces stereotypes. If you want to weaken some stereotype, eliminate the classification.”

“The beauty of the experiment was that there was a correct answer to the question: What is the probability that I am holding the bag of mostly red chips? It was provided by a statistical formula called Bayes’s theorem (after Thomas Bayes, who, strangely, left the formula for others to discover in his papers after his death, in 1761). Bayes’s rule allowed you to calculate the true odds, after each new chip was pulled from it, that the bag in question was the one with majority white, or majority red, chips. Before any chips had been withdrawn, those odds were 50:50—the bag in your hands was equally likely to be either majority red or majority white. But how did the odds shift after each new chip was revealed?”

“The power of the belief could be seen in the way people thought of totally random patterns—like, say, those created by a flipped coin. People knew that a flipped coin was equally likely to come up heads as it was tails. But they also thought that the tendency for a coin flipped a great many times to land on heads half the time would express itself if it were flipped only a few times—an error known as “the gambler’s fallacy.” People seemed to believe that if a flipped coin landed on heads a few times in a row it was more likely, on the next flip, to land on tails—as if the coin itself could even things out. “Even the fairest coin, however, given the limitations of its memory and moral sense, cannot be as fair as the gambler expects it to be,” they wrote. In an academic journal that line counted as a splendid joke.”

“The belief in the law of small numbers: Here was the intellectual error that Danny and Amos suspected that a lot of psychologists made, because Danny had made it . . . The test they administered to psychologists confirmed that suspicion. When seeking to determine if the bag they held contained mostly red chips, psychologists were inclined to draw, from very few chips, broad conclusions. In their search for scientific truth, they were relying far more than they knew on chance. What’s more, because they had so much faith in the power of small samples, they tended to rationalize whatever they found in them.”

“When they learned of Hoffman’s findings, the World Trade Center’s engineer, its architect, and assorted officials from the New York Port Authority flew to Eugene to experience the sway room themselves. They were incredulous. Robertson later recalled his reaction for the New York Times: “A billion dollars right down the tube.” He returned to Manhattan and built his very own sway room, where he replicated Hoffman’s findings. In the end, to stiffen the buildings, he devised, and installed in each of them, eleven thousand two-and-a-half-foot-long metal shock absorbers. The extra steel likely enabled the buildings to stand for as long as they did after they were struck by commercial airliners, and it allowed some of the fourteen thousand people who escaped to flee before the buildings collapsed.”

“Amos would say, ‘People are not so complicated. Relationships between people are complicated.’ And then he would pause, and say: ‘Except for Danny.’”

“In these and many other uncertain situations, the mind did not naturally calculate the correct odds. So what did it do? The answer they now offered: It replaced the laws of chance with rules of thumb. These rules of thumb Danny and Amos called “heuristics.” And the first heuristic they wanted to explore they called “representativeness.”

“People find it a remarkable coincidence when two students in the same classroom share a birthday, when in fact there is a better than even chance, in any group of twenty-three people, that two of its members will have been born on the same day.”

“Danny and Amos had their first big general idea – the mind had these mechanisms for making judgments and decisions that were usually useful but also capable of generating serious error . . . The more easily people can call some scenario to mind – the more available it is to them – the more probable they find it to be.”

“People could be anchored with information that was totally irrelevant to the problem they were being asked to solve.”

“There is much evidence showing that, once an uncertain situation has been perceived or interpreted in a particular fashion, it is quite difficult to view it in any other way.”

“In his talk to the historians, Amos described their occupational hazard: the tendency to take whatever facts they had observed (neglecting the many facts that they did not or could not observe) and make them fit neatly into a confident-sounding story,”

“But the article described three ways in which people made judgments when they didn’t know the answer for sure. The names the authors had given these – **representativeness, availability, anchoring** – were at once weird and seductive. They made the phenomenon they described feel like secret knowledge.”

“There was a reason for this: To acknowledge uncertainty was to admit the possibility of error. The entire profession had arranged itself as if to confirm the wisdom of its decisions.”

“People who are in distress seek care. When they seek care, physicians feel the need to do something. You put leeches on; the condition improves. And that can propel a lifetime of leeches. A lifetime of overprescribing antibiotics. A lifetime of giving tonsillectomies to people with ear infections. You try it and they get better the next day and it is so compelling. You go to see a psychiatrist and your depression improves – you are convinced of the efficacy of psychiatry.”

“The job of the decision maker wasn’t to be right but to figure out the odds in any decision and play them well.”

“Apparently the director-general didn’t want to rely on the best estimates. He preferred his own internal probability calculator: his gut. “That was the moment I gave up on decision analysis,” said Danny. “No one ever made a decision because of a number. They need a story.”

“When they made decisions, people did not seek to maximize utility. They sought to minimize regret.”

“Of course, expected utility theory also predicted that people would take a sure gain over a bet that offered an expected value of an even bigger gain. They were “risk averse.” But what was this thing that everyone had been calling “risk aversion?” It amounted to a fee that people paid, willingly, to avoid regret: a regret premium.”

“For most people, the happiness involved in receiving a desirable object is smaller than the unhappiness involved in losing the same object.”

“Whatever that emotion was, it became stronger as the odds became more remote. If you told them that there was a one-in-a-billion chance that they’d win or lose a bunch of money, they behaved as if the odds were not one in a billion but one in ten thousand. They feared a one-in-a-billion chance of loss more than they should and attached more hope to a one-in-a-billion chance of gain than they should. People’s emotional response to extremely long odds led them to reverse their usual taste for risk, and to become risk seeking when pursuing a long-shot gain and risk avoiding when faced with the extremely remote possibility of loss. (Which is why they bought both lottery tickets and insurance.) “If you think about the possibilities at all, you think of them too much,” said Danny. “When your daughter is late and you worry, it fills your mind even when you know there is very little to fear.” You’d pay more than you should to rid yourself of that worry.”

“This one they called “framing.” Simply by changing the description of a situation, and making a gain seem like a loss, you could cause people to completely flip their attitude toward risk, and turn them from risk avoiding to risk seeking.”

“People did not choose between things. They chose between descriptions of things.”

“The endowment effect was a psychological idea with economic consequences. People attached some strange extra value to whatever they happened to own, simply because they owned it, and so proved surprisingly reluctant to part with their possessions, or endowments, even when trading them made economic sense.”

“Danny now had an idea that there might be a fourth heuristic – to add to availability, representativeness, and anchoring. “The simulation heuristic,” he’d eventually call it, and it was all about the power of unrealized possibilities to contaminate people’s minds.”

“In undoing some event, the mind tended to remove whatever felt surprising or unexpected – which was different from saying that it was obeying the rules of probability.”

“Gigerenzer came to be identified with a strain of thought known as evolutionary psychology, which had in it the notion that the human mind, having adapted to its environment, must be very well suited to it. It certainly wouldn’t be susceptible to systematic biases. Amos found that notion absurd. The mind was more like a coping mechanism than it was a perfectly designed tool.”

“The federal government now became sensitive to both loss aversion and framing effects: People didn’t choose between things, they chose between descriptions of things. The fuel labels on new automobiles went from listing only miles per gallon to including the number of gallons a car consumed every hundred miles. What used to be called the food pyramid became MyPlate, a graphic of a dinner plate with divisions for each of the five food groups, and it was suddenly easier for Americans to see what made for a healthy diet.”