



The Undoing Project

A Friendship that Changed Our Minds

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How a Nobel Prize–winning theory of the mind altered our perception of reality.

Forty years ago, Israeli psychologists Daniel Kahneman and Amos Tversky wrote a series of breathtakingly original studies undoing our assumptions about the decision-making process. Their papers showed the ways in which the human mind erred, systematically, when forced to make judgments in uncertain situations. Their work created the field of behavioral economics, revolutionized 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. Kahneman and Tversky are more responsible than anybody for the powerful trend to mistrust human intuition and defer to algorithms.

The Undoing Project is about a compelling collaboration between two men who have the dimensions of great literary figures. They became heroes in the university and on the battlefield—both had important careers in the Israeli military—and their research was deeply linked to their extraordinary life experiences. Amos Tversky was a brilliant, self-confident warrior and extrovert, the center of rapt attention in any room; Kahneman, a fugitive from the Nazis in his childhood, was an introvert whose questing self-doubt was the seedbed of his ideas. They became one of the greatest partnerships in the history of science, working together so closely that they couldn’t remember whose brain originated which ideas, or who should claim credit. They flipped a coin to decide the lead authorship on the first paper they wrote, and simply alternated thereafter.

This story about the workings of the human mind is explored through the personalities of two fascinating individuals so fundamentally different from each other that they seem unlikely friends or colleagues. In the process they may well have changed, for good, mankind’s view of its own mind.

My Synopsis:

A mindboggling mix of psychology, economics, and fantastic storytelling, woven together in a way that is both stimulating and exhausting. This book leaves me with so many questions and ideas that I’m not sure where to take them. And I’m not sure I’m smart enough to truly figure that out, but the adventure will be fun.

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A Friendship That Changed Our Minds

p. 21 **Man Boobs**

p. 24 Your mind needs to be in a constant state of defense against all this crap that is trying to mislead you.

– Daryl Morey

p. 27 ...people with a gift for using numbers to predict things would overrun professional sports management and every place else high-stakes decisions were being made...

p. 28 ...a big part of a consultant's job was to feign total certainty about uncertain things.

p. 28 A lot of what people did and said when they "predicted" things was phony: pretending to know things rather than actually knowing things.

p. 31 ...a new definition of the nerd: a person who knows his own mind well enough to mistrust it.

p. 31 Knowledge is anything that increases your ability to predict the outcome. – Daryl Morey

p. 37 How could any model predict the future of a player who had intentionally failed?

p. 38 You have to figure out what the model is good and bad at, and what humans are good and bad at.

p. 40 ...a lot of people found it very hard to ignore the evidence of their own eyes.

p. 41 Whatever prejudice a person brought to the business of selecting amateur players he tended to preserve, even when it served him badly, because he was always looking to have that prejudice confirmed.

p. 42 Maybe the mind's best trick of all was to lead its owner to a feeling of certainty about inherently uncertain things.

p. 44 Simply knowing about a bias wasn't sufficient to overcome it.

p. 51 These people (sports team owners) tended to be keenly aware of the value of even slight informational advantages.

p. 52 **The Outsider**

p. 53 ...people were endlessly complicated and interesting.

p. 59 Faith is God made sensible to the heart. – Pascal

p. 60 His survival had depended on keeping himself apart, and preventing others from seeing him for what he was.

p. 68 It's only when decisions are made by people that they get more complicated.

p. 69 ...all animal behavior was driven not by thoughts and feelings but by external rewards and punishments.

p. 69 ...the science of behavior is not yet as successful in controlling emotion as it is in shaping behavior.

p. 70 ...there was no obvious relationship between any external stimulus and the sensation it created in people, as the mind intervened in many curious ways.

p. 78 If perception had the power to overwhelm reality in such a simple case, how much power might it have in a more complicated one?

p. 80 ...designed to determine not how a person thought of himself but how the person had actually behaved.

p. 83 Remove their gut feelings, and their judgments improved.

p. 85 **The Insider**

p. 86 ...how easy it is to shift from an efficient killing machine to compassionate human being, and how quick the switch may be.

p. 89 ...interesting things happened to people who could weave them into interesting stories.

- p. 94 He compelled himself to be brave until bravery became a habit.
- p. 97 ...people paid an enormous price to avoid mild embarrassment.
- p. 98 They've already taken my money, should I give them my time too? – Amos Tversky
- p. 103 Economists assumed that people were “rational.” What did they mean by that?
- p. 107 Clearly people had trouble detecting small differences.
- p. 111 If the mind, when it compares two things, essentially counts up the features it notices in each of them, it might also judge those things to be at once more similar and more dissimilar to each other than some other pair of things.
- p. 114 The idea was interesting: when people make decisions, they are also making judgments about similarity, between some object in the real world and what they ideally want.
- p. 115 By changing the context in which two things are compared, you submerge certain features and force others to the surface.
- p. 115 ...The mere act of classification reinforces stereotypes. If you want to weaken some stereotype, eliminate the classification.
- p. 116 **Errors**
- p. 132 Stuff put into the mind without the mind's full awareness.
- p. 135 They found that it wasn't just emotional arousal that altered the size of the pupil: Mental effort had the same effect.
- p. 135 Cocktail party effect: the ability of people to filter a lot of noise for the sounds they wished to hear...
- p. 136 ...Treisman proposed that people possessed, not an on-off switch that enabled them to pay attention to whatever they intended to pay attention to, but a more subtle mechanism that selectively weakened, rather than entirely blocked, background noise.
- p. 138 Reforms always create winners and losers, and the losers will always fight harder than the winners.
– Danny Kahneman
- p. 139 ...the most effective way to teach people longer strings of information was to feed the information into their minds in smaller chunks.
- p. 142 **The Collision**
- p. 146 Life is filled with games of chance: How well do people play them? How accurately do they assess new information? ...Do they allow what just happened to alter, accurately, their sense of the odds of what will happen next?
- p. 149 This is what happens when people become attached to a theory. They fit the evidence to the theory rather than the theory to the evidence.
- p. 152 If human beings had been shaped so carefully for their environment, why was their perception of that environment still prone to error?
- p. 153 It cannot be that judgment does not connect with perception. Thinking is not a separate act.
- p. 153 When you are a pessimist and the bad thing happens, you live it twice; once when you worry about it, and the second time when it happens.
- p. 159 People mistook even a very small part of a thing for the whole.
- p. 161 In their search for scientific truth, they were relying far more than they knew on chance.
- p. 163 Statistics was the way you should think about probabilistic situations, but statistics was not the way people did it.

- p. 163 If the evidence of the world tells you it is true, then people figure out what's true. – Matthew Robin
- p. 164 People's intuitive expectations are governed by a consistent misperception of the world.
- p. 165 **The Mind's Rules**
- p. 169 ...we just had a feeling this was important: how people took pieces of information and somehow processed that and came up with a decision or a judgment.
- p. 169 I thought that if you understood how people make judgments and decisions, you could improve judgment and decision making. – Paul Slovic
- p. 169 People often said they were doing one thing when they were actually doing another.
- p. 173 Accuracy on this task was not associated with the amount of professional experience of the judge. – Lew Goldberg
- p. 174 You could beat the doctor by replacing him with an equation created by people who knew nothing about medicine and had simply asked a few questions of doctors.
- p. 175 ...it would appear that only rarely – if at all – will the utilities favor the continued employment of man over a model of man. – Lew Goldberg
- p. 182 If people did not use statistical reasoning, even when faced with a problem that could be solved with statistical reasoning, what kind of reasoning did they use?
- p. 183 The world's not just a stage. It's a casino, and our lives are games of chance.
- p. 184 If the mind's approach to uncertainty was occasionally misleading, it was because it was often so useful.
- p. 185 We have a kind of stereotype of "randomness" that differs from true randomness.
- p. 186 If our minds can be misled by our false stereotype of something as measurable as randomness, how much might they be misled by other, vaguer stereotypes?
- p. 188 ...if people's judgments were distorted by representativeness when the odds were knowable, how likely was it that their judgments were any better when the odds were a total mystery?
- p. 188 ...the mind had these mechanisms for making judgments and decisions that were usually useful but also capable of generating serious error.
- p. 190 ...people's judgment was, systematically very wrong. And it was wrong, Danny and Amos now proposed, because it was distorted by memory. It was simply easier to recall words that start with K than to recall words with K as their third letter.
- p. 190 The more easily people can call some scenarios to mind – the more available it is to them – the more probable they find it to be.
- p. 192 Human judgment was distorted by...the memorable.
- p. 192 ...another source of error: not just that people don't know what they don't know, but that they don't bother to factor their ignorance into their judgments.
- p. 193 People could be anchored with information that was totally irrelevant to the problem they were being asked to solve.
- p. 194 The stories we make up, routed in our memories, effectively replace probability judgments.
- p. 194 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. – Kahneman and Tversky
- p. 194 Images of the future are shaped by experience of the past. – Kahneman and Tversky
- p. 194 We often decide that an outcome is extremely unlikely or impossible, because we are unable to imagine any chain of events that could cause it to occur. The defeat, often, is in our imagination. – Kahneman and Tversky

p. 196 **The Rules of Prediction**

- p. 196 A human being who finds himself stuck at some boring meeting or cocktail party often finds it difficult to invent an excuse to flee.
- p. 197 *People predict by making up stories*
People predict very little and explain everything
People live under uncertainty whether they like it or not
People believe they can tell the future if they work hard enough
People accept any explanation as long as it fits the facts
The handwriting was on the wall, it was just the ink that was invisible
People often work hard to obtain information they already have and avoid new knowledge
Man is a deterministic device thrown into a probabilistic universe
In this match, surprises are expected
Everything that has already happened must have been inevitable
- p. 198 In making predictions and judgments under uncertainty, people do not appear to follow the calculus of chance or the statistical theory of prediction. Instead they rely on a limited number of heuristics which sometimes yield reasonable judgments and sometimes lead to severe and systematic error.
- p. 201 Having established that people would allow a stereotype to warp their judgment, Amos and Danny then wondered: If people are willing to make irrational predictions based on that sort of information, what kind of predictions might they make if we give them totally irrelevant information?
- p. 202 When no specific evidence is given, the prior probabilities are properly utilized; when worthless specific evidence is given, prior probabilities are ignored. – Kahneman and Tversky
- p. 202 ...they showed that the very factors that caused people to become more confident in their predictions also led those predictions to be less accurate.
- p. 203 Man's inability to see the power of regression to the mean leaves him blind to the nature of the world around him.
- p. 208 He who sees the past as surprise-free is bound to have a future full of surprises. – Tversky
- p. 208 A false view of what has happened in the past makes it harder to see what might occur in the future.
- p. 212 **Going Viral**
- p. 214 Wherever there is uncertainty there has got to be judgment, and wherever there is judgment there is an opportunity for human fallibility. – Don Redelmeier
- p. 214 They (doctors) sometimes failed to notice what they were not directly assigned to notice.
- p. 215 ...Redelmeier asked everyone to slow down. To wait. Just a moment. Just to check their thinking – and to make sure they were not trying to force the facts into an easy, coherent, but ultimately false story.
- p. 216 It wasn't that what first came to mind was always wrong; it was that its existence in your mind led you to feel more certain than you should be that it was correct.
- p. 219 What was so compelling is that the mistakes were predictable and systematic.
- p. 221 To acknowledge uncertainty was to admit the possibility of error.
- p. 223 Error wasn't necessarily shameful; it was merely human.
- p. 224 ...the inability of human beings to judge risks, even when their misjudgment might kill them.
- p. 226 People facing a life-and-death decision responded not to the odds but to the way the odds were described to them.

- p. 229 The point was that he (a physician) could not treat his patient one way, and groups of patients suffering from precisely the same problem in another way, and be doing his best in both cases. Both could not be right.
- p. 230 A part of good science is to see what everyone else can see but think what no one else has ever said.
The difference between being very smart and very foolish is often very small.
So many problems occur when people fail to be obedient when they are supposed to be obedient, and fail to be creative when they are supposed to be creative.
The secret to doing good research is always to be a little underemployed. You waste years by not being able to waste hours.
It is sometimes easier to make the world a better place than to prove you have made the world a better place.
– Amos Tversky
- P. 234 (People) didn't simply experience fixed levels of happiness or unhappiness. They experienced one thing and remembered something else.
- p. 234 ...people preferred to endure more total pain so long as the experience ended on a more pleasant note.
- p. 236 Last impressions can be lasting impressions. – Don Redelmeier
- p. 237 (Redelmeier) wanted to use data to find true patterns in human behavior, to replace the false ones that governed people's lives and, often, their deaths.
- P 238 **Birth of the Warrior Psychologist**
- p. 247 ...crucial decisions are made, today as thousands of years ago, in terms of the intuitive guesses and preferences of a few men in positions of authority. – Daniel Kahneman
- p. 250 No one ever made a decision because of a number. They need a story. – Daniel Kahneman
- p. 251 Not every judgment is followed by a decision, but every decision implies judgment.
- p. 261 The understanding of any decision had to account not just for the financial consequences but for the emotional ones too.
- p. 261 It is then anticipation of regret that affects decisions, along with the anticipation of other consequences.
– Daniel Kahneman
- p. 261 People did not seek to avoid other emotions with the same energy they sought to avoid regret.
- p. 261 When they made decisions, people did not seek to maximize utility. They sought to minimize regret.
- p. 263 Regret was sufficiently imaginable that people conjured it out of situations they had no control over.
- p. 264 The more control you felt you had over the outcome of a gamble, the greater the regret you experienced if the gamble turned out badly.
- p. 268 **The Isolation Effect**
- p. 269 When choosing between sure things and gambles, people's desire to avoid loss exceeded their desire to secure gain.
- p. 269 For most people, the happiness involved in receiving a desirable object is smaller than the unhappiness involved in losing the same object.
- p. 270 ...people responded to changes rather than absolute levels.
- p. 270 ...people approached risk very differently when it involved losses than when it involved gains.
- p. 271 People did not respond to probability in a straight-forward manner.

- p. 271 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.
- p. 275 The reference point was a state of mind.
- p. 276 ...when you framed the sure thing as a loss, people chose the gamble. When you framed it as a gain, people picked the same thing.
- p. 276 ...people faced with a risky choice failed to put it in context. They evaluated it in isolation.
- p. 276 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 taking.
- p. 278 *People did not choose between things. They choose between descriptions of things.*
- p. 283 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.
- p. 284 The irrational behavior of the few would not be offset by the rational behavior of the many.
- p. 291 **The Rules of Undoing**
- p. 300 ...how people undid events that had already happened.
- p. 300 What if I say what I think instead of pretending to agree?
- p. 301 (Danny)...wanted to investigate how people created alternatives to reality by undoing reality.
- p. 302 ...the feelings that spurred people's minds to spin alternative realities in order to avoid the pain of emotion.
- p. 303 The more consequences an event has, the larger the change that is involved in eliminating that event.
– Daniel Kahneman
- p. 304 With the passage of time, the consequences of any event accumulated, and left more to undo.
- p. 304 The distance the mind needed to travel from the usual way of doing things to some less ordinary way of doing things felt further than the trip made from the other direction.
- p. 312 Reality is a cloud of possibility, not a point. – Amos Tversky
- p. 312 **This Cloud of Possibility**
- p. 317 People had trouble seeing when their minds were misleading them.
- p. 328 Any prediction, for instance, could be made to seem more believable, even as it became less likely, if it was filled with internally consistent details.
- p. 339 **Bora-Bora**
- p. 343 Choice architecture: decisions people made were driven by the way they were presented. People didn't simply know what they wanted; they took cues from their environment. They *constructed* their preferences. And they followed paths of least resistance, even when they paid a heavy price for it.
- p. 345 A part of good science is to see what everyone else can see but think what no one else has ever said.
– Amos Tversky
- p. 346 It is sometimes easier to make the world a better place than to prove you have made the world a better place.
– Amos Tversky
- p. 347 ...an early death was the price of being a Spartan.
- p. 351 ...people's anticipation of happiness differed from the happiness they experienced, and how both differed from the happiness they remembered.
- p. 352 Then the phone rang.