YOU CAN BEAT YOUR BRAIN

How to Turn your Enemies into Friends,
How to Make Better Decisions, and
Other Ways to Be Less Dumb

DAVID McRANEY

ONEWORLD

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For Maggie.
Thanks for helping me get out of that swamp.

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YOU CAN BEAT YOUR BRAIN

INTRODUCTION

Self-Delusion

THE MISCONCEPTION: *You are a being of logic and reason.*

THE TRUTH: *You are a being capable of logic and reason who falls short of that ideal in predictable ways.*

This is a book about self-delusion, but also a celebration of it. You see, self-delusion is as much a part of the human condition as fingers and toes, and that is what we are going to explore here. Delusions, that is, not phalanges.

You assume you are intelligent, capable, rational, and full of the same glorious reason that invented calculus and ginger snaps. You were born with a chip on your shoulder, and you've grown into a sort of undeserved confidence over the years. It's a human foible that comes in many flavors, and I'm assuming you are human. If you are a hyperintelligent dog, a member of an alien race, or a robot historian from our future, I apologize; please move on to the first chapter. If not, proceed toward your epiphany.

The human mind is obviously vaster and more powerful than any other animal mind, and that's something people throughout all

human history couldn't help but notice. You probably considered this the last time you visited the zoo or watched a dog battle its own hind legs. Your kind seems the absolute pinnacle of what evolution can produce, maybe even the apex and final beautiful result of the universe unfolding itself. It is a delectable idea to entertain. Even before we had roller skates and Salvador Dalí, it was a conviction in which great thinkers liked to wallow. Of course, as soon as you settle into that thought, you'll accidentally send an e-mail to your boss meant for your proctologist, or you'll read a news story about how a man got trapped in a public bin in Aberdeen. It's always true that whenever you look at the human condition and get a case of the smugs, a nice heaping helping of ridiculousness plops in your lap and remedies the matter.

The truth is that the human brain generates a mind that is deeply flawed. There are some things you just aren't very good at and never will be. Evidence of your dumbness is everywhere. Calculators, notepads, to-do lists, checkbooks, alarm clocks—there are hundreds of inventions and applications for sale in every marketplace to make up for your shortcomings. Entire fields of expertise exist to make up for a gulf in your abilities.

Our discussion of the scientific study of self-delusion is probably best led off with the concept of preconceived notions, so let's begin with a brief story about the thirty-first time Dartmouth College and Princeton University faced off in American football. That game helped launch an endless fleet of expeditions into the human mind, many of which you will read about after this paragraph concludes.

Both founded in the mid-1700s, Dartmouth and Princeton are part of the Ivy League of universities in the northeastern United States. You may have heard of the other six universities: Brown, Columbia, Cornell, Harvard, Penn, and Yale. *Ivy League* has

become synonymous with the sort of people who wear "fancy pants." The names are among the most desired bullet points on a CV, but *Ivy League* began as a term sportswriters used for the eight universities in New England that tended to compete against one another exclusively in athletics and, well, almost everything else.

In 1951, Dartmouth and Princeton squared off in the last game of the season for both universities. Princeton had won every game up to that point. Its star player, Dick Kazmaier, had been featured on the cover of *Time* that same year and would go on to become the last Ivy League player to receive the Heisman Trophy. It was a big game for both teams, which is why Princeton went bonkers in the second quarter, after a Dartmouth player broke Kazmaier's nose. In the next quarter, a Princeton player snapped a Dartmouth player's leg. The whole event was brutal, and both sides racked up plenty of penalties before Princeton finally won by a final score of 13–0.

Psychologists Albert Hastorf at Dartmouth and Hadley Cantril at Princeton noticed soon after the game the student newspapers of each university began printing stories that seemed to suggest two versions of the truth were in open competition to become the official version of reality. A year later, the two published a study that is now considered by many to be the best starting point for talking about self-delusion.

Hastorf and Cantril noticed that Princeton's newspaper and alumni newsletter published accounts of the game that painted the Dartmouth team as bullies who played dirty. At the same time, Dartmouth's newspaper published editorials explaining away the injuries caused by its team while also noting the awfulness of Princeton's tactics. Both sides, the researchers said, remembered seeing different games. What if these students could watch the

game again? thought the scientists. Sure, they remembered the game differently, but what if we showed them a film of it? Would they see the game differently in real time as well? To answer this, the scientists acquired a recording of the entire matchup, showed it to undergraduates from both universities, and had those students check when they saw infractions, in addition to marking how severe each infraction seemed. The students also filled out questionnaires.

The results? During the film, Princeton students believed they were watching a violent, uncivilized game and Dartmouth was to blame. Ninety percent wrote they felt Dartmouth had started the unsportsmanlike conduct. They also reported seeing twice as many infractions coming from Dartmouth than they saw coming from Princeton, and they found those infractions committed by their own university's team to be much milder than those committed by their university's opponents. Dartmouth students, however, saw something else. They didn't see the game as unnecessarily barbarous, but as justifiably "rough and fair." The majority of Dartmouth subjects reported both teams were to blame for the aggressive play and Princeton students were just angry because their superstar had gotten hurt. Boo hoo. They recorded an equal number of infractions by both teams but, overall, marked down half as many for their own side than did the Princeton students.

The scientists explained that each person saw a different game despite the fact that all had watched the same film. Each person experienced a different version of reality, of the truth, each in some way adulterated by his allegiance.

The great lesson of Princeton versus Dartmouth concerns how tiny and arbitrary variations can change everything. The students who watched the film, regardless of whether they had attended the

real event, experienced two different versions of reality, even though on paper they all seemed like nearly identical people. As students of male-only Ivy League universities three hundred miles apart in the 1950s, they were the same ethnically and socioeconomically. As undergraduates, they were all about the same age. As northeastern U.S. citizens, they had similar cultural and religious beliefs. The only difference between them was which university they had chosen to attend. The research suggests that if you could have turned back time and had those students enroll at different universities, switching the campuses they would later stroll, their realities would also have switched.

This is where preconceived notions lead you, into naive realism—a very old concept in philosophy that was long ago murdered, burned, and buried by science. Naive realism asks this question: Do I see the world as it actually is? The answer, according to a naive realist, is yes. Up until recently, on the grand scale of human history, this what-you-see-is-what-you-get theory of the mind has had its defenders, so, in case the Princeton-Dartmouth example wasn't enough for you, let's go ahead and squash it before we move on.

As a modern person you should know that a motion picture is just individual photographs whizzing by faster than your brain can process. When you look at a flower, you should know that you don't see the same thing a butterfly sees and that if you switched your eyes for insect eyes the floral world would become a psychedelic explosion of madness. Your unnavigable nighttime living room is a completely visible playground to a cat, and if you've ever shined a laser pointer near a feline pal, then surely you've realized something is going on in its tiny cat head that isn't happening in

yours. You know the world is not what it seems, and all it takes is one great optical illusion to prove it. Naive realism is, well, naive. The stars are always in the sky, but the light of the sun filtered through the atmosphere makes them difficult to see in the day. If you throw a rock into a pond, and that *sploosh* turns the heads of a frog and a fox, what they see is not what you see. Each creature's version of reality is unique to its nervous system. The frog, the fox, and the person all experience the same real thing but react to differing internal representations. Your perception isn't the only perception out there, and if the inputs can be fooled, then the image is not to be trusted.

Okay, so that's a simple concept, and you've likely pondered it before, but as the football game study shows, there is another level of naive realism that is a lot harder to accept. Like most people, you tend not to question this, and it persists in just about every head on Earth.

Look away and around for a second and come back to this sentence. The things out there that you just saw in your mind aren't generated by those objects. What you see isn't the simple result of light bouncing into your eyeholes. What you see, recall, and feel emotionally is 100 percent created by chemical reactions in your braincase, and that means those things are susceptible to influence, editing, redacting, and all sorts of other ingredients that get added to consciousness when you construct reality out of inputs both external and internal. To paraphrase psychologist Daniel Gilbert, memory, perception, and imagination are representations not replicas.

A memory is least accurate when most reflected upon, and most accurate when least pondered. Together, those two facts make eyewitness testimony basically worthless. This isn't what

most people believe. Psychologists Dan Simons and Christopher Chabris published a study in 2011 revealing that 63 percent of those surveyed in the United States believe memory works like a video camera, and another 48 percent believe memories are permanent. An additional 37 percent said that eyewitness testimony was reliable enough to be the only evidence necessary to convict someone accused of a crime. Those are seriously shocking facts to a psychologist or a neuroscientist, because none of those things is true. You don't record everything you see, nor do you notice everything that comes into your mind. The only things that make it past the ears and eyes are those things to which you attend. Memories are not recordings. The moment your first kiss was over, the memory of it began to decay. Each time you recall it, the event is reformed in your mind anew and differently, influenced by your current condition and by all the wisdom you've acquired since and all the erroneous details you've added.

Psychology now knows you make forecasts and decisions based on internal mental models and memories, and you assume those models and memories are accurate and perfect. Over time, with each new study, it has become increasingly clear that those models and memories are flawed, imperfect, and skewed. So it follows that your forecasts and decisions are just as mistaken.

You greatly underestimate how easily and how often you delude yourself, and how your perception can be dramatically altered from within. Throughout this book you will see that you do not passively receive reality. You actively participate in the creation of your personal universe.

The last one hundred years of research suggest that you, and everyone else, still believe in a form of naive realism. You still believe that although your inputs may not be perfect, once you get to

thinking and feeling, those thoughts and feelings are reliable and predictable. We now know that there is no way you can ever know an "objective" reality, and we know that you can never know how much of subjective reality is a fabrication, because you never experience anything other than the output of your mind. Everything that's ever happened to you has happened inside your skull. Even the sensation of having an arm is projected by the brain. It feels and looks like your arm is out there in space, but even that can be a misconception. Your arm is actually in your head. Each brain creates its own version of the truth, broadly similar but infinitely different and flawed in its details.

Hastorf and Cantril, the scientists who studied the students at Dartmouth and Princeton, said in their research that the game didn't even exist, when you got right down to it. In the same way that a salad is just a pile of chopped-up vegetables and leaves, the game in question was just the events taking place in one space between two presses of a stopwatch. Sure, people performed actions in front of other people, and the people watching noticed some of what happened, but the game itself is just an idea, a social construct. Out of the billions of things that occurred that day in 1951, fans of both teams placed significance on a particular set of things happening in one location and agreed to call that thing a football game. That culturally defined significance helped observers define their experiences. According to the scientists, unlike most things in life, sports offer up a nice lattice of rules and boundaries, a demarcated space and assigned roles that produce routine actions. In sports, thanks to those parameters, it becomes much easier to agree on what happens during the time allotted. Yet people routinely disagree, even when the whole thing is recorded and can be played back exactly as it occurred. What is real is not just what comes into

your eyes and bounces around in your mind. You change your reality as it happens. You alter your own perception unconsciously. The implications are monumental when you apply this knowledge to wars, politics, social movements, economics, and all the other titans of influence in your life that don't happen in an arena with agreed-upon rules and aren't recorded perfectly by history.

You see, being smart is a much more complicated and misunderstood state than you believe. Most of the time, you are terrible at making sense of things. If it were your job, you would long since have been fired. You think you are a rational agent, slowly contemplating your life before making decisions and choices, and though you may sometimes falter, for the most part you keep it together, but that's not the case at all. You are always under the influence of irrational reasoning. You persist in a state of deluded deliberation. You are terrible at explaining yourself to yourself, and you are unaware of the depth and breadth of your faults in this regard. You feel quite the opposite, actually. You maintain an unrealistic confidence in your own perceptions even after your limitations are revealed. It is at this intersection of presumption and weakness, the beautiful combination of assurance and imperfection, where we will be spending most of our time together. This is an exploration of some of the most compelling self-deceptions that have been identified and quantified by science. This is the stuff that should be in the instruction manual for operating a human body—just like the entries science recently added about trans fats and glutens.

Herein lies a catalogue of some of the things science has learned about the flaws of the human mind and how your brain lies to you, how it cheats and edits and alters reality, and how you fall for it over and over again. So, what sorts of things will we be exploring?

Well, when it comes to your mind, you are often unaware of the source of your own feelings and thoughts, your own behaviors and memories, but instead of bumbling about confused and frightened, you possess a giant toolkit of tricks and techniques by which you invent scenarios that make life easier to comprehend, and then you believe in those scenarios. Over years and years, that jumble becomes the story of your life.

One such tool is the heuristic. In order to survive, your ancestors needed to think and act quickly. Heuristics make big, complex, daunting ideas tiny and easier to manage. Simple heuristics explain the world to you in ways that allow you to keep moving without putting too much thought into a situation. When it comes to problem solving and decision making, you have heuristics that render complicated things very simple. You use the affect heuristic, for example, to make decisions based on whether a person, problem, or situation makes you feel positive or negative emotions. Does the guy running for mayor creep you out? Let's not vote for him. Did that doctor paint her offices puke green? Let's not go there again. Heuristics appear in the strangest places, such as when you ponder if you should donate money to those people who make commercials about dogs and cats that get tortured and abandoned. When you wonder if you should write a cheque, you don't ask whether that organization is legitimate, or what the chances are an abused animal can be rehabilitated, or if the organization has a strong track record in resource allocation. You instead ask yourself if the images of abused animals make you sad. The answer to that question is much easier to solve, and you then assume that you've solved the more complicated questions. This mental alchemy is applied to everything in your life, from whether you should quit your job to who should get your vote for president. Complicated and

confusing questions morph into gut checks, and gut checks are often unreliable. When you use heuristics, you tend to believe you've been rationally contemplating your existence, when in reality you just took a shortcut and never looked back.

Another giant stumbling block in your mental life is a collection of predictable patterns of thought called cognitive biases. A bias is a tendency to think in one way when other options are just as good, if not better. For instance, if you tend to take a right turn every time you walk into a supermarket when turning to the left would be no better, you have a right-turn bias in your own behavior. Most people are biased in this way, and most large chain stores develop displays and lay out their interiors with this in mind. Most cognitive biases are completely natural and unlearned. They can be teased out of every person with a functioning brain. So, no matter if you were born in Egypt or Aberdeen, in 1902 or 2002, you still have the same collection of inherited cognitive biases every other human must deal with. Scientists speculate that most biases are adaptive, which just means that over millions of years they served as dependable fallback positions when you were unsure how to act or feel. For instance, you have a hindsight bias that makes you believe your predictions about the future are usually accurate because you falsely assume you've been able to predict the outcome of events all your life. The truth, however, is that you are terrible at making predictions but great at rewriting your memories to make it seem as if you were right all along. You also suffer from a confirmation bias that causes you to seek out information that confirms your worldview while avoiding and ignoring threatening information. Over time, this creates a bubble in which it seems there is a monumental amount of consensus for your beliefs.

Heuristics allow you to think and act faster, and biases influence

you to behave in ways that typically keep primates alive and active. In modern life, though, your heuristics and biases get challenged all the time, and that's when you pull out logical fallacies. Logical fallacies appear during arguments with yourself and others. You often begin with a conclusion already in mind and then work toward proving that you were not stupid to have drawn that conclusion in the first place. This sort of motivated reasoning often depends on warping logic to make things work out in your head. For instance, you might say hot dogs are a disgusting manufactured food product, and you can't believe your cousin is serving them to his children, because no child should be forced to eat gross food. You've just committed a fallacy because your assumption was in your original statement: hot dogs are nasty. You've proved nothing. Your argument didn't make the case about the nastiness of digestible casings filled with beef trimmings and fat. You've only stated what you believe and then said that what you believe informs your opinions. You can untangle this fallacy by rewording it like so: *Kids shouldn't be forced to eat food I believe is gross*. You get confused in your own logic all the time and end up twisting language to make the world line up with your preconceived notions.

Logical fallacies, fuzzy heuristics, and incorrect cognitive biases are joined by an array of other odd truths about your dull approach to making sense of things. You are only able to pay attention to a very few things at once, but you feel as if you are paying attention to everything that appears before your eyes and emits sound near your ears. When you do pay attention, those senses are themselves very limited and imperfect. You then use what comes into your brain through those senses to construct an internal reality that both introduces into consciousness things that aren't real and subtracts from reality things you would rather not accept. Add to this the compli-

cated and vast system of emotions and intuitions, and you can see how tilted your view of reality can be from moment to moment. That tilted view is translated into incomplete, inaccurate memories that degrade with each recall. The glue of narrative—the innate human skill for storytelling—holds the whole misinformed hodgepodge together. Your ability to tell stories keeps you sane and stable, even if those stories can be pretty far from the truth.

Despite how fallible you are, how gullible and biased and hornswoggled you tend to be day to day, or how much the image you have of yourself doesn't really match the real you, you get by, most of the time. It's a real problem, though, when politicians, CEOs, and other people with the power to change the way the world works start bungling their arguments for or against things based on self-delusion generated by imperfect minds and senses. In the fields of neuroscience, psychology, and economics, the major faults of your mind have been known for about fifty years now. Work continues in those and other fields, unraveling the nuances, but most of what science has learned on this topic has remained under academic hats. You are lucky to live at a time when that knowledge is just now starting to trickle into the conversations of laypeople. That's the aim here: to get some of these insights into your shortcomings out there where they can be put to good use.

Some of what we will discuss has to do with the wiring of the brain, some with cultural influences, and some with ancient behavioral routines. The brain in your head was built by evolution, and the world in which your ancestors lived was full of situations you no longer face. Still, you err on the side of caution just in case. If someone throws a rope on you while you are napping, there is really no harm in freaking out, screaming, and flailing around while you try to hold in your pee. If a poisonous snake had fallen

on you, such a response would have been an excellent course of action. It would be much more costly if every time you woke up to a snakelike impact you just yawned and calmly brushed it aside. Over the course of millions of years, the creatures who didn't freak out at snake-shaped objects didn't make as many babies as the people who did, and now that same fear is in you, along with fears of skittering creepy crawlies, heights, dark places, and strangers. This sets you up to be more afraid of terrorists than home furniture, even though falling couches and televisions take more lives each year. When you consider the world that shaped your mind is the world you are most equipped to handle, it makes sense that things such as car engines and weight loss and soufflé recipes are so hard to understand, much less laparoscopic medicine and quantum physics.

This is not a book about abnormal psychology. It is about normal psychology, the common, default, baked-into-every-brain sort of thinking you can expect to find in rocket scientists, heads of state, and the lady at the office who has a kitten calendar for personal use and a fireman calendar for business meetings. You think seeing is believing, that your thoughts are always based on reasonable intuitions and rational analysis, and that though you may falter and err from time to time, for the most part you stand as a focused, intelligent operator of the most complicated nervous system on Earth. You believe that your abilities are sound, your memories perfect, your thoughts rational and wholly conscious, the story of your life true and accurate, and your personality stable and stellar. The truth is that your brain lies to you. Inside your skull is a vast and far-reaching personal conspiracy to keep you from uncovering the facts about who you actually are, how capable you tend to be, and how confident you deserve to feel. That undeserved confidence alters your behavior and creates a giant, easily opened

back door through which waltz con artists, magicians, public relations employees, advertising executives, pseudoscientists, peddlers of magical charms, and others. You can learn about yourself when you take on the perspective of those who see through your act and know how to manipulate your gullibility. A great deal can be learned and gained by focusing on your failings.

Thanks to a new way of approaching psychology, science is now beginning to paint a picture of your flaws and shortcomings, and this book is a collection of some of the most interesting delusions discovered so far. I hope when you read them you have the same epiphanies I did when I first came across them. Consider this a humility shock-and-awe campaign designed to help you feel more connected with the community of humanity. We're all in this together, and these are our shared mental stumbling blocks. Use what you learn here to be kinder to others and more honest with yourself. There are some concrete, counterintuitive, and fascinating ways to beat your brain.

Let's get started.