



How to make better choices in life and work



NEW YORK TIMES BESTSELLING AUTHORS

CHIP & DAN HEATH

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About the Book

Just making a decision can be hard enough, but how do you begin to judge whether it's the right one?

In *Decisive*, best-selling authors Chip and Dan Heath draw on decades of psychological research to explain why we so often get it very badly wrong - why our supposedly rational brains are frequently tripped up by powerful biases and wishful thinking. At the same time they demonstrate how relatively easy it is to avoid the pitfalls and find the best answers, offering four simple principles that we can all learn and follow. In the process, they show why it is that experts frequently make mistakes. They demonstrate the perils of getting trapped in a narrow decision frame. And they explore people's tendency to be over-confident about how their choices will unfold. Drawing on case histories as diverse as the downfall of Kodak and the inspiring account of a cancer survivor, they offer both a fascinating tour through the workings of our minds and an invaluable guide to making smarter decisions.

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The Heath brothers are the authors of the national bestsellers *Switch* and *Made to Stick*.

ALSO BY CHIP HEATH AND DAN HEATH

Switch
Made to Stick

DECISIVE

**How to
make better
choices
in life
and work**

CHIP HEATH AND DAN HEATH

rh
BOOKS

To our wives,
Susan and Amanda,
the best decisions
we ever made

Introduction

Shannon, the head of a small consulting firm, is agonizing about whether to fire Clive, her IT director. Over the past year, Clive has consistently failed to do more than the minimum required of him. He's not without his talents—he's intelligent and has a knack for improvising cheap solutions to technical problems—but he rarely takes any initiative. Worse, his attitude is poor. In meetings, he is often critical of other people's ideas, sometimes caustically so.

Unfortunately, losing Clive would cause problems in the short-term. He understands how to maintain the company's database of clients better than anyone else.

What would you advise her to do? Should she fire him or not?

IF YOU REFLECT ON the past few seconds of your mental activity, what's astonishing is how quickly your opinions started to form. Most of us, reflecting on the Clive situation, feel like we already know enough to start offering advice. Maybe you'd advise Shannon to fire Clive, or maybe you'd encourage her to give him another chance. But chances are you didn't feel flummoxed.

"A remarkable aspect of your mental life is that you are rarely stumped," said Daniel Kahneman¹, a psychologist who won the Nobel Prize in economics for his research on the way that people's decisions depart from the strict rationality assumed by economists. In his fascinating book, *Thinking, Fast and Slow*, he describes the ease with which we draw conclusions: "The normal state of your mind is that you have intuitive feelings and opinions about almost

everything that comes your way. You like or dislike people long before you know much about them; you trust or distrust strangers without knowing why; you feel that an enterprise is bound to succeed without analyzing it.”

Kahneman says that we are quick to jump to conclusions because we give too much weight to the information that’s right in front of us, while failing to consider the information that’s just offstage. He called this tendency “what you see is all there is.” In keeping with Kahneman’s visual metaphor, we’ll refer to this tendency as a “spotlight” effect. (Think of the way a spotlight in a theater directs our attention; what’s inside the spotlight is crisply illuminated.)

The Clive situation above is an example of the spotlight effect. When we’re offered information about Clive—he does only the bare minimum, he doesn’t take initiative, he has a poor attitude, and his boss might fire him—we find it very easy to take that readily available set of information and start drawing conclusions from it.

But of course a spotlight only lights a spot. Everything outside it is obscured. So, in Clive’s situation, we don’t immediately think to ask a lot of obvious questions. For instance, rather than fire Clive, why not change his role to match up better with his strengths? (After all, he’s good at improvising cheap solutions.) Or maybe Clive could be matched with a mentor who’d help him set more ambitious goals and deliver less scathing criticism.

Furthermore, what if we dug deeper and discovered that Clive’s colleagues adore his crusty, straight-talking ways? (Maybe he’s the IT version of Dr. House.) And what makes us think that Shannon’s take on Clive is impeccably accurate? What if she is a terrible manager? When we begin shifting the spotlight from side to side, the situation starts to look very different. We couldn’t possibly hope to make a good decision about Clive without doing this spotlight shifting. Yet developing an opinion was easy without doing it.

And that, in essence, is the core difficulty of decision making: What's in the spotlight will rarely be everything we need to make a good decision, but we won't always remember to shift the light. Sometimes, in fact, we'll forget there's a spotlight at all, dwelling so long in the tiny circle of light that we forget there's a broader landscape beyond it.

IF YOU STUDY THE kinds of decisions people make and the outcomes of those decisions, you'll find that humanity does not have a particularly impressive track record.

Career choices², for instance, are often abandoned or regretted. An American Bar Association survey found that 44% of lawyers would recommend that a young person not pursue a career in law. A study of 20,000 executive searches found that 40% of senior-level hires "are pushed out, fail or quit within 18 months." More than half of teachers quit their jobs within four years. In fact, one study in Philadelphia schools found that a teacher was almost two times more likely to drop out than a student.

Business decisions³ are frequently flawed. One study of corporate mergers and acquisitions—some of the highest-stakes decisions executives make—showed that 83% failed to create any value for shareholders. When another research team asked 2,207 executives to evaluate decisions in their organizations, 60% of the executives reported that bad decisions were about as frequent as good ones.

On the personal front⁴ we're not much better. People don't save enough for retirement, and when they do save, they consistently erode their own stock portfolios by buying high and selling low. Young people start relationships with people who are bad for them. Middle-aged people let work interfere with their family lives. The elderly wonder why they didn't take more time to smell the roses when they were younger.

Why do we have such a hard time making good choices? In recent years, many fascinating books and articles have addressed this question, exploring the problems with our decision making. The biases. The irrationality. When it comes to making decisions, it's clear that our brains are flawed instruments. But less attention has been paid to another compelling question: Given that we're wired to act foolishly sometimes, how can we do better?^{fn1}

Sometimes we are given the advice to trust our guts when we make important decisions. Unfortunately, our guts are full of questionable advice⁵. Consider the Ultimate Red Velvet Cheesecake at the Cheesecake Factory, a truly delicious dessert—and one that clocks in at 1,540 calories, which is the equivalent of three McDonald's double cheeseburgers plus a pack of Skittles. This is something that you are supposed to eat after you are finished with your real meal.

The Ultimate Red Velvet Cheesecake is exactly the kind of thing that our guts get excited about. Yet no one would mistake this guidance for wisdom. Certainly no one has ever thoughtfully plotted out a meal plan and concluded, *I gotta add more cheesecake*.

Nor are our guts any better on big decisions. On October 10, 1975, Liz Taylor and Richard Burton celebrated the happy occasion of their wedding. Taylor was on her sixth marriage, Burton on his third. Samuel Johnson once described a second marriage as the "triumph of hope over experience." But given Taylor and Burton's track record their union represented something grander: the triumph of hope over a mountain of empirical evidence. (The marriage lasted 10 months.)

Often our guts can't make up their minds⁶ at all: an estimated 61,535 tattoos were reversed in the United States in 2009. A British study of more than 3,000 people found that 88% of New Year's resolutions are broken,

including 68% of resolutions merely to “enjoy life more.” Quarterback Brett Favre retired, then unretired, then retired. At press time he is ~~playing~~ retired.

If we can't trust our guts, then what can we trust? Many businesspeople put their faith in careful analysis. To test this faith, two researchers, Dan Lovallo, a professor at the University of Sydney, and Olivier Sibony, a director of McKinsey & Company, investigated 1,048 business decisions over five years, tracking both the ways the decisions were made and the subsequent outcomes in terms of revenues, profits, and market share. The decisions were important ones, such as whether or not to launch a new product or service, change the structure of the organization, enter a new country, or acquire another firm.

The researchers found that in making most of the decisions, the teams had conducted rigorous analysis. They'd compiled thorough financial models and assessed how investors might react to their plans.

Beyond the analysis, Lovallo and Sibony⁷ also asked the teams about their decision *process*—the softer, less analytical side of the decisions. Had the team explicitly discussed what was still uncertain about the decision? Did they include perspectives that contradicted the senior executive's point of view? Did they elicit participation from a range of people who had different views of the decision?

When the researchers compared whether process or analysis was more important in producing good decisions—those that increased revenues, profits, and market share—they found that “process mattered more than analysis—by a factor of six.” Often a good process led to better analysis—for instance, by ferreting out faulty logic. But the reverse was not true: “Superb analysis is useless unless the decision process gives it a fair hearing.”

To illustrate the weakness of the decision-making process in most organizations, Sibony drew an analogy to the legal

system:

Imagine walking into a courtroom where the trial consists of a prosecutor presenting PowerPoint slides. In 20 pretty compelling charts, he demonstrates why the defendant is guilty. The judge then challenges some of the facts of the presentation, but the prosecutor has a good answer to every objection. So the judge decides, and the accused man is sentenced. That wouldn't be due process, right? So if you would find this process shocking in a courtroom, why is it acceptable when you make an investment decision?

Now of course, this is an oversimplification, but this process is essentially the one most companies follow to make a decision. They have a team arguing only one side of the case. The team has a choice of what points it wants to make and what way it wants to make them. And it falls to the final decision maker to be both the challenger and the ultimate judge. Building a good decision-making process is largely ensuring that these flaws don't happen.

Dan Lovallo says that when he talks about process with corporate leaders, they are skeptical. "They tend not to believe that the soft stuff matters more than the hard stuff," he said. "They don't spend very much time on it. Everybody thinks they know how to do this stuff." But the ones who do pay attention reap the rewards: A better decision process substantially improves the results of the decisions, as well as the financial returns associated with them.

The discipline exhibited by good corporate decision makers—exploring alternative points of view, recognizing uncertainty, searching for evidence that contradicts their beliefs—can help us in our families and friendships as well. A solid process isn't just good for business; it's good for our lives.

Why a process? Because understanding our shortcomings is not enough to fix them. Does knowing you're nearsighted help you see better? Or does knowing that you have a bad temper squelch it? Similarly, it's hard to correct a bias in our mental processes just by being aware of it.

Most of us rarely use a "process" for thinking through important decisions, like whether to fire Clive, or whether to relocate for a new job, or how to handle our frail, elderly

parents. The only decision-making process in wide circulation is the pros-and-cons list. The advantage of this approach is that it's deliberative. Rather than jump to conclusions about Clive, for example, we'd hunt for both positive and negative factors—pushing the spotlight around—until we felt ready to make a decision.

What you may not know is that the pros-and-cons list has a proud historical pedigree. In 1772, Benjamin Franklin was asked for advice by a colleague who'd been offered an unusual job opportunity. Franklin replied in a letter that, given his lack of knowledge of the situation, he couldn't offer advice on whether or not to take the job. But he did suggest a process the colleague could use to make his own decision. Franklin said that his approach was "to divide half a sheet of paper by a line into two columns, writing over the one Pro and over the other Con." During the next three or four days, Franklin said, he'd add factors to the two columns as they occurred to him. Then, he said:

When I have thus got them all together in one view, I endeavour to estimate their respective weights; and where I find two, one on each side, that seem equal, I strike them both out: If I find a reason Pro equal to some two reasons Con, I strike out the three. If I judge some two reasons Con equal to some three reasons Pro, I strike out the five; and thus proceeding I find at length where the balance lies; and if after a day or two of farther consideration nothing new that is of importance occurs on either side, I come to a determination accordingly. [Capitalization modernized.]

Franklin called this technique "moral algebra⁸." Over 200 years after he wrote this letter, his approach is still, broadly speaking, the approach people use when they make decisions (that is, when they're not trusting their guts). We may not follow Franklin's advice about crossing off pros and cons of similar weight, but we embrace the gist of the process. When we're presented with a choice, we compare the pros and cons of our options, and then we pick the one that seems the most favorable.

The pros-and-cons approach is familiar. It is commonsensical. And it is also profoundly flawed.

Research in psychology over the last 40 years has identified a set of biases in our thinking that doom the pros-and-cons model of decision making. If we aspire to make better choices, then we must learn how these biases work and how to fight them (with something more potent than a list of pros and cons).

Prepare to encounter the four most pernicious villains of decision making—and a process that we can use to counteract their influence.

[fn1](#) See page 255 for a more thorough list of our recommended decision books, but to understand the problems we face in making decisions, essential reading would include Daniel Kahneman's book, *Thinking, Fast and Slow*, mentioned above, and Dan Ariely's *Predictably Irrational*. One of the handful of books that provides advice on making decisions better is *Nudge* by Richard Thaler and Cass Sunstein, which was written for "choice architects" in business and government who construct decision systems such as retirement plans or organ-donation policies. It has been used to improve government policies in the United States, Great Britain, and other countries.

1

The Four Villains of Decision Making

1.

Steve Cole⁹, the VP of research and development at HopeLab, a nonprofit that fights to improve kids' health using technology, said, "Any time in life you're tempted to think, 'Should I do this OR that?' instead, ask yourself, 'Is there a way I can do this AND that?' It's surprisingly frequent that it's feasible to do both things."

For one major project, Cole and his team at HopeLab wanted to find a design partner, a firm that could help them design a portable device capable of measuring the amount of exercise that kids were getting. There were at least seven or eight design firms in the Bay Area that were capable of doing the work. In a typical contracting situation, HopeLab would have solicited a proposal from each firm and then given the winner a giant contract.

But instead of choosing a winner, Cole ran a "horse race." He shrank down the scope of the work so that it covered only the first step of the project, and then he hired five different firms to work on the first step independently. (To be clear, he wasn't quintupling his budget—as a nonprofit, HopeLab didn't have unlimited resources. Cole knew that what he'd learn from the first round would make the later rounds more efficient.)

With his horse race, Cole ensured that he'd have multiple design alternatives for the device. He could either pick his favorite or combine the best features of several. Then, in round two of the design, he could weed out any vendors who were unresponsive or ineffective.

Cole is fighting the first villain of decision making, narrow framing, which is the tendency to define our choices too narrowly, to see them in binary terms. We ask, "Should I break up with my partner or not?" instead of "What are the ways I could make this relationship better?" We ask ourselves, "Should I buy a new car or not?" instead of "What's the best way I could spend some money to make my family better off?"

In the introduction, when we asked the question "Should Shannon fire Clive or not?" we were stuck in a narrow frame. We spotlighted one alternative at the expense of all the others.

Cole, with his horse race, is breaking out of that trap. It wasn't an obvious move; he had to fight for the concept internally. "At first, my colleagues thought I was insane. At the beginning, it costs some money and takes some time. But now everybody here does it. You get to meet lots of people. You get to know lots of different kinds of things about the industry. You get convergence on some issues, so you know they are right, and you also learn to appreciate what makes the firms different and special. None of this can you do if you're just talking to one person. And when all of those five firms know that there are four other shops involved, they bring their best game."

Notice the contrast with the pros-and-cons approach. Cole could have tallied up the advantages and disadvantages of working with each vendor and then used that analysis to make a decision. But that would have reflected narrow framing. Implicitly, he would have been assuming that there was one vendor that was uniquely

capable¹⁰ of crafting the perfect solution, and that he could identify that vendor on the basis of a proposal.

2.

There's a more subtle factor involved too—Cole, in meeting with the teams, would have inevitably developed a favorite, a team he clicked with. And though intellectually he might have realized that the people he likes personally aren't necessarily the ones who are going to build the best products, he would have been tempted to jigger the pros-and-cons list in their favor. Cole might not even have been aware he was doing it, but because pros and cons are generated in our heads, it is very, very easy for us to bias the factors. We think we are conducting a sober comparison but, in reality, our brains are following orders from our guts.

Our normal habit in life is to develop a quick belief about a situation and then seek out information that bolsters our belief. And that problematic habit, called the “confirmation bias¹¹,” is the second villain of decision making.

Here's a typical result from one of the many studies on the topic: Smokers in the 1960s, back when the medical research on the harms of smoking was less clear, were more likely to express interest in reading an article headlined “Smoking Does Not Lead to Lung Cancer” than one with the headline “Smoking Leads to Lung Cancer.” (To see how this could lead to bad decisions, imagine your boss staring at two research studies headlined “Data That Supports What You Think” and “Data That Contradicts What You Think.” Guess which one gets cited at the staff meeting?)

Researchers have found this result again and again. When people have the opportunity to collect information from the world, they are more likely to select information

that supports their preexisting attitudes, beliefs, and actions. Political partisans seek out media outlets that support their side but will rarely challenge their beliefs by seeking out the other side's perspective. Consumers who covet new cars or computers will look for reasons to justify the purchase but won't be as diligent about finding reasons to postpone it.

The tricky thing about the confirmation bias is that it can look very scientific. After all, we're collecting data. Dan Lovallo, the professor and decision-making researcher cited in the introduction, said, "Confirmation bias is probably the single biggest problem in business, because even the most sophisticated people get it wrong. People go out and they're collecting the data, and they don't realize they're cooking the books."

At work and in life, we often pretend that we want truth when we're really seeking reassurance: "Do these jeans make me look fat?" "What did you think of my poem?" These questions do not crave honest answers.

Or pity the poor contestants who try out to sing on reality TV shows, despite having no discernible ability to carry a tune. When they get harsh feedback from the judges, they look shocked. Crushed. And you realize: This is the first time in their lives they've received honest feedback. Eager for reassurance, they'd locked their spotlights on the praise and support they received from friends and family. Given that affirmation, it's not hard to see why they'd think they had a chance to become the next American Idol. It was a reasonable conclusion drawn from a wildly distorted pool of data.

And this is what's slightly terrifying about the confirmation bias: When we want something to be true, we will spotlight the things that support it, and then, when we draw conclusions from those spotlighted scenes, we'll congratulate ourselves on a reasoned decision. Oops.

3.

In his memoir, *Only the Paranoid Survive*, Andy Grove recalled a tough dilemma he faced in 1985 as the president of Intel: whether to kill the company's line of memory chips. Intel's business had been built on memory. For a time, in fact, the company was the world's only source of memory, but by the end of the 1970s, a dozen or so competitors had emerged.

Meanwhile, a small team at Intel¹² had developed another product, the microprocessor, and in 1981 the team got a big break when IBM chose Intel's microprocessor to be the brain of its new personal computer. Intel's team scrambled to build the manufacturing capacity it would need to produce the chips.

At that point, Intel became a company with two products: memory and microprocessors. Memory was still the dominant source of the company's revenue, but in the early 1980s, the company's competitive position in the memory business came under threat from Japanese companies. "People who came back from visits to Japan told scary stories," said Grove. It was reported that one Japanese company was designing multiple generations of memory all at once—the 16K people were on one floor, the 64K people were a floor above, and the 256K team was above them.

Intel's customers began to rave about the quality of the Japanese memories. "In fact, the quality levels attributed to Japanese memories were beyond what we thought possible," said Grove. "Our first reaction was denial. This had to be wrong. As people often do in this kind of situation, we vigorously attacked the data. Only when we confirmed for ourselves that the claims were roughly right did we start to go to work on the quality of our product. We were clearly behind."

Between 1978 and 1988, the market share held by Japanese companies doubled from 30% to 60%. A debate

raged inside Intel about how to respond to the Japanese competition. One camp of leaders wanted to leapfrog the Japanese in manufacturing. They proposed building a giant new factory to make memory chips. Another camp wanted to bet on an avant-garde technology that they thought the Japanese couldn't match. A third camp wanted to double down on the company's strategy of serving specialty markets.

As the debate continued with no resolution, the company began losing more and more money. The microprocessor business was growing rapidly, but Intel's failures in memory were becoming a drag on profits. Grove summarized the year 1984 by saying, "It was a grim and frustrating year. During that time, we worked hard without a clear notion of how things were ever going to get better. We had lost our bearings."

In the middle of 1985, after more months of fruitless debate, Grove was discussing the memory quandary in his office with Intel's chairman and CEO, Gordon Moore. They were both fatigued by the internal deliberations. Then Grove had an inspiration:

I looked out the window at the Ferris Wheel of the Great America amusement park revolving in the distance, then I turned back to Gordon and I asked, "If we got kicked out and the board brought in a new CEO, what do you think he would do?" Gordon answered without hesitation, "He would get us out of memories."

I stared at him, numb, then said, "Why shouldn't you and I walk out the door, come back in, and do it ourselves?"

This was the moment of clarity. From the perspective of an outsider, someone not encumbered by the historical legacy and the political infighting, shutting down the memory business was the obvious thing to do. The switch in perspectives—"What would our successors do?"—helped Moore and Grove see the big picture clearly.

Of course, abandoning memory was not easy. Many of Grove's colleagues were furiously opposed to the idea.

Some held that memory was the seedbed of Intel's technology expertise and that without it, other areas of research were likely to wither. Others insisted that Intel's sales force could not get customers' attention without selling a full range of products—memories as well as microprocessors.

After much “gnashing of teeth,” Grove insisted that the sales force tell their customers that Intel would no longer be carrying memory products. The customers' reaction was, essentially, a big yawn. One said, “It sure took you a long time.”

Since that decision in 1985, Intel has dominated the microprocessor market. If, on the day of Grove's insight, you had invested \$1,000 in Intel, by 2012 your investment would have been worth \$47,000 (compared with \$7,600 for the S&P 500, a composite of other big companies). It seems safe to say that he made the right decision.

GROVE'S STORY REVEALS A flaw in the way many experts think about decisions. If you review the research literature on decisions, you'll find that many decision-making models are basically glorified spreadsheets¹³. If you are shopping for an apartment, for instance, you might be advised to list the eight apartments you found, rank them on a number of key factors (cost, location, size, etc.), assign a weighting that reflects the importance of each factor (cost is more important than size, for instance), and then do the math to find the answer (um, move back in with Mom and Dad).

There's one critical ingredient missing from this kind of analysis: emotion. Grove's decision wasn't difficult because he lacked options or information; it was difficult because he felt conflicted. The short-term pressures and political wrangling clouded his mind and obscured the long-term need to exit the memory business.

This brings us to the third villain of decision making: short-term emotion. When we've got a difficult decision to

make, our feelings churn. We replay the same arguments in our head. We agonize about our circumstances. We change our minds from day to day. If our decision was represented on a spreadsheet, none of the numbers would be changing—there’s no new information being added—but it doesn’t feel that way in our heads. We have kicked up so much dust that we can’t see the way forward. In those moments, what we need most is perspective.

Ben Franklin was aware of the effects of temporary emotion. His moral algebra wisely suggests that people add to their pros-and-cons list over several days, giving them a chance to add factors as they grow more or less excited about a particular idea. Still, though, to compare options rigorously is not the same as seeing the bigger picture. No doubt Andy Grove had been compiling his pros-and-cons list about whether to exit the memory business for many years. But the analysis left him paralyzed, and it took a quick dose of detachment—seeing things from the perspective of his successor—to break the paralysis.

4.

The odds of a meltdown¹⁴ are one in 10,000 years.

—Vitali Sklyarov, minister of power and electrification in the Ukraine, two months before the Chernobyl accident

Who the hell wants to hear actors talk¹⁵?

—Harry Warner, Warner Bros. Studios, 1927

What use could this company make of an electrical toy¹⁶?

—William Orton, president of the Western Union Telegraph Company, in 1876, rejecting an opportunity to purchase Alexander Graham Bell’s patent on the telephone

Our search for the final villain of decision making takes us back to January 1, 1962, when a young four-man rock-and-roll group named the Beatles was invited to audition in London for one of the two major British record labels, Decca Records. “We were all excited,” recalled John Lennon. “It was Decca.” During an hourlong audition, they played fifteen different songs, mostly covers. The Beatles¹⁷ and their manager, Brian Epstein, were hopeful they’d get a contract, and they waited anxiously for a response.

Eventually they received the verdict: Decca had decided to pass. In a letter to Epstein, Dick Rowe, a prominent talent scout at Decca Records, wrote, “We don’t like your boys’ sound. Groups are out; four-piece groups with guitars, particularly, are finished.”

As Dick Rowe would soon learn, the fourth villain of decision making is overconfidence. People think they know more than they do about how the future will unfold.

Recall that Andy Grove’s colleagues had dire predictions of what would happen if Intel stopped making memory chips. *We will lose the seedbed of our R&D. Our sales force can’t succeed without a full line of products.* History proves that they were wrong: Intel’s R&D and sales stayed strong. But what’s interesting is that, at the time they made these proclamations, they didn’t feel uncertain. They weren’t hedging their remarks by saying, “It’s possible that ...” or “I just worry that this could happen someday....” They knew they were right. They just knew it.

A study showed that when doctors reckoned themselves “completely certain” about a diagnosis, they were wrong 40% of the time. When a group of students made estimates that they believed had only a 1% chance of being wrong, they were actually wrong 27% of the time.

We have too much confidence in our own predictions. When we make guesses about the future, we shine our spotlights on information that’s close at hand, and then we

draw conclusions from that information. Imagine the head of a travel agency in 1992: *My travel agency is the market leader in Phoenix, and we have the best customer relationships. This area is growing so rapidly, we could easily double in size over the next ten years. Let's get ahead of the curve and build those additional branches.*

The problem is that we don't know what we don't know. *Whoops, the Internet. So much for my travel agency.*

The future has an uncanny ability to surprise. We can't shine a spotlight on areas when we don't know they exist.

LET'S SUM UP WHERE we are. If you think about a normal decision process, it usually proceeds in four steps¹⁸:

- You encounter a choice.
- You analyze your options.
- You make a choice.
- Then you live with it.

And what we've seen is that there is a villain that afflicts each of these stages:

- You encounter a choice. **But narrow framing makes you miss options.**
- You analyze your options. **But the confirmation bias leads you to gather self-serving information.**
- You make a choice. **But short-term emotion will often tempt you to make the wrong one.**
- Then you live with it. **But you'll often be overconfident about how the future will unfold.**

So, at this point, we know what we're up against. We know the four top villains of decision making. We also know that the classic pros-and-cons approach is not well suited to fighting these villains; in fact, it doesn't meaningfully counteract any of them.

Now we can turn our attention to a more optimistic question: What's a process that *will* help us overcome these villains and make better choices?

5.

In the fall of 1772, a man named Joseph Priestley¹⁹ was struggling with a career decision, and the way he handled the decision points us toward a solution.

Priestley, a brilliant man with an astonishing variety of talents, did not lack for career options. He was employed as a minister for a Dissenting church in Leeds, England. (“Dissenting” meant that it was not affiliated with the Church of England, the state-sanctioned religion.) But he was a man with many hobbies, all of which seemed to take on historical significance. As an advocate for religious tolerance, he helped to found the Unitarian Church in England. As a philosopher, he wrote works on metaphysics that were cited as important influences by John Stuart Mill and Jeremy Bentham.

An accomplished scientist, Priestley is credited with the discovery of 10 gases, including ammonia and carbon monoxide. He is best known for discovering the most important gas of them all: oxygen.^{fn1}

A political rabble-rouser, Priestley spoke out in favor of the French Revolution, which aroused the suspicion of the government and his fellow citizens. Later, as tempers flared, a mob burned down his home and church, forcing him to flee, first to London and eventually to the United States, where he spent the rest of his life.

Priestley was a theologian, a chemist, an educator, a political theorist, a husband, and a father. He published more than 150 works, ranging from a history of electricity to a seminal work on English grammar. He even invented soda water, so every time you enjoy your Diet Coke, you can thank Priestley.

In short, Priestley’s career was a bit like an eighteenth-century version of *Forrest Gump*, if Gump were a genius. He intersected with countless movements of historical and

scientific significance. But in the fall of 1772, he had a much more prosaic problem on his hands: money.

Priestley, like any father, worried about the financial security of his growing family. His salary as a minister—100 pounds a year—was not sufficient to build substantial savings for his children, who eventually numbered eight. So he started looking for other options, and some colleagues connected him with the Earl of Shelburne, a science buff and a supporter of Dissenting religious groups in England's House of Lords. Shelburne was recently widowed and looking for intellectual companionship and help in training his children.

Lord Shelburne offered Priestley a job as a tutor and an adviser. For a salary of 250 pounds a year, Priestley would supervise the education of Lord Shelburne's children and counsel him on political and governmental matters. Priestley was impressed by the offer—particularly the money, of course—but was also cautious about what he'd be signing on for. Seeking advice, he wrote to several colleagues he respected, including a wise and resourceful man he'd met while writing the history of electricity: Benjamin Franklin.

FRANKLIN REPLIED WITH THE moral-algebra letter cited in our introduction, suggesting that Priestley use the process of pros and cons to guide his decision.

Thanks to the record provided by Priestley's letters to friends, it's possible to imagine how Priestley would have used the moral-algebra process. The pros: good money; better security for his family.

The cons were more plentiful. The job might require a move to London, which bothered Priestley, who described himself as "so happy at home" that he hated to contemplate being apart from his family. He worried, too, about the relationship with Shelburne. Would it feel like master and servant? And even if it started off fine, what would happen

if Shelburne grew tired of him? Finally, Priestley worried that the commitments would distract him from more important work. Would he end up spending his days teaching multiplication to kids instead of blazing new intellectual paths in religion and science?

From the perspective of the pros-and-cons list, accepting the offer looks like a pretty bad decision. There's basically one big pro—money—stacked up against an array of serious cons. Fortunately, though, Priestley largely ignored Franklin's advice and found ways to circumvent the four villains of decision making.

First, he rejected the narrow frame: *Should I take this offer or not?* Instead, he started pushing for new and better options. He considered alternative ways to bring in more income, such as speaking tours to lecture on his scientific work. In the spirit of "AND not OR" he negotiated for a better deal with Shelburne, at a time when people rarely questioned the nobility. Priestley ensured that a tutor, rather than he, would handle the education of Shelburne's kids, and he arranged to spend most of his time in the country with his family, making trips to London only when Shelburne really needed him.

Second, he dodged the confirmation bias. Early in the process, Priestley received a strong letter from a friend who argued vehemently against Shelburne's offer, insisting that it would humiliate Priestley and leave him dependent on a nobleman's charity. Priestley took the objection quite seriously, and at one point he reported that he was leaning against the offer. But rather than stewing over his internal pros-and-cons list, he went out and collected more data. Specifically, he sought the advice of people who *knew* Shelburne, and the consensus was clear: "Those who are acquainted with Lord Shelburne encourage me to accept his proposal; but most of those who know the world in general, but not Lord Shelburne in particular, dissuade me from it." In other words, the people who knew the lord best

were the most positive about the offer. Based on these converging assessments, Priestley began to consider the offer more seriously.

Third, Priestley got some distance from his short-term emotions. He sought advice from friends as well as more neutral colleagues such as Franklin. He didn't allow himself to be distracted by visceral feelings: the quick flush of being offered a 150% raise or the social shame of being thought "dependent" by a friend. He made his decision based on the two factors he cared most about in the long term: his family's welfare and his scholarly independence.

Finally, he avoided overconfidence. He expected the relationship to fare well, but he knew that he might be wrong. He worried, in particular, about leaving his family exposed financially if Shelburne had a sudden change of heart about the arrangement. So he negotiated a sort of insurance policy: Shelburne agreed to pay him 150 pounds a year for life, even if their relationship was terminated.

In the end, Priestley accepted the offer, and he worked for Lord Shelburne for about seven years. It would be one of the most prolific periods of his career, the period of his most important philosophical work and his discovery of oxygen.

Shelburne and Priestley eventually parted ways. The reasons aren't clear, but Priestley said they separated "amicably," and Shelburne honored his agreement to provide 150 pounds a year to the newly independent Priestley.

6.

We believe Priestley made a good decision to work with Shelburne, though it's impossible to say for certain. After all, it's possible that spending time with Shelburne distracted him just enough to stop him from making yet