Thinking in Bets

Making Smarter Decisions

When You Don't Have All the Facts

Annie Duke

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To Lila and Henry Gleitman, generous of heart and intellect

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INTRODUCTION

Why This Isn't a Poker Book

When I was twenty-six, I thought I had my future mapped out. I had grown up on the grounds of a famous New Hampshire prep school, where my father chaired the English department. I had graduated from Columbia University with degrees in English and psychology. I had attended graduate school at the University of Pennsylvania, where I won a fellowship from the National Science Foundation, earning a master's and completing my doctoral course work in cognitive psychology.

But I got sick right before finishing my dissertation. I took a leave of absence, left Penn, got married, and moved to a small town in Montana. Not surprisingly, my NSF fellowship didn't cover my cross-country experiment in adulting, so I needed money. My brother Howard, a professional poker player who had already made the final table of the World Series of Poker by this time, suggested I check out the legal poker games in Billings. This suggestion wasn't as random as it might sound. I grew up in a competitive, games-playing family, and Howard had brought me out to Las Vegas a few times for vacations I couldn't otherwise afford on my stipend. I had watched him play, and played in a few low-stakes games myself.

I fell in love with poker right away. It wasn't the bright lights of Vegas that lured me in, but the thrill of playing and testing my skills in the basement of a Billings bar named the Crystal Lounge. I had a lot to learn, but I was excited to learn it. My plan was to earn some money during this break

from school, stay on the academic path, and continue playing poker as a hobby.

My temporary break turned into a twenty-year career as a professional poker player. When I retired from playing in 2012, I had won a World Series of Poker gold bracelet, the WSOP Tournament of Champions, and the NBC National Heads-Up Championship, and earned more than $4 million in poker tournaments. Howard, meanwhile, went on to win two World Series bracelets, a pair of titles at the Hall of Fame Poker Classic, two World Poker Tour championships, and over $6.4 million in tournament prize money.

To say that I had strayed from the academic path might seem like an understatement. But I realized pretty quickly that I hadn't really left academics so much as moved to a new kind of lab for studying how people learn and make decisions. A hand of poker takes about two minutes. Over the course of that hand, I could be involved in up to twenty decisions. And each hand ends with a concrete result: I win money or I lose money. The result of each hand provides immediate feedback on how your decisions are faring. But it's a tricky kind of feedback because winning and losing are only loose signals of decision quality. You can win lucky hands and lose unlucky ones. Consequently, it's hard to leverage all that feedback for learning.

The prospect of some grizzled ranchers in Montana systematically taking my money at a poker table forced me to find practical ways to either solve this learning puzzle or go broke. I was lucky, early in my career, to meet some exceptional poker players and learn from them how they handled not only luck and uncertainty but also the relationship between learning and decision-making.

Over time, those world-class poker players taught me to understand what a bet really is: a decision about an uncertain future. The implications of treating decisions as bets made it possible for me to find learning opportunities in uncertain environments. Treating decisions as bets, I discovered, helped me avoid common decision traps, learn from results in a more rational way, and keep emotions out of the process as much as possible.

In 2002, thanks to my friend and super-successful poker player Erik Seidel turning down a speaking engagement, a hedge-fund manager asked me to speak to a group of traders and share some poker tips that might apply to securities trading. Since then, I have spoken to professional groups across many industries, looking inward at the approach I learned in poker, continually refining it, and helping others apply it to decisions in financial markets, strategic planning, human resources, law, and entrepreneurship.

The good news is that we can find practical work-arounds and strategies to keep us out of the traps that lie between the decisions we'd like to be making and the execution of those decisions. The promise of this book is that thinking in bets will improve decision-making throughout our lives. We can get better at separating outcome quality from decision quality, discover the power of saying, "I'm not sure," learn strategies to map out the future, become less reactive decision-makers, build and sustain pods of fellow truthseekers to improve our decision process, and recruit our past and future selves to make fewer emotional decisions.

I didn't become an always-rational, emotion-free decision-maker from thinking in bets. I still made (and make) plenty of mistakes. Mistakes, emotions, losing—those things are all inevitable because we are human. The approach of thinking in bets moved me *toward* objectivity, accuracy, and open-mindedness. That movement compounds over time to create significant changes in our lives.

So this is not a book about poker strategy or gambling. It is, however, about things poker taught me about learning and decision-making. The practical solutions I learned in those smoky poker rooms turned out to be pretty good strategies for anyone trying to be a better decision-maker.

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Thinking in bets starts with recognizing that there are exactly two things that determine how our lives turn out: the quality of our decisions and luck.

Learning to recognize the difference between the two is what thinking in bets is all about.

CHAPTER 1

Life Is Poker, Not Chess

Pete Carroll and the Monday Morning Quarterbacks

One of the most controversial decisions in Super Bowl history took place in the closing seconds of Super Bowl XLIX in 2015. The Seattle Seahawks, with twenty-six seconds remaining and trailing by four points, had the ball on second down at the New England Patriots' one-yard line. Everybody expected Seahawks coach Pete Carroll to call for a handoff to running back Marshawn Lynch. Why wouldn't you expect that call? It was a short-yardage situation and Lynch was one of the best running backs in the NFL.

Instead, Carroll called for quarterback Russell Wilson to pass. New England intercepted the ball, winning the Super Bowl moments later. The headlines the next day were brutal:

- *USA Today*: "What on Earth Was Seattle Thinking with Worst Play Call in NFL History?"
- *Washington Post*: "'Worst Play-Call in Super Bowl History' Will Forever Alter Perception of Seahawks, Patriots"
- FoxSports.com: "Dumbest Call in Super Bowl History Could Be Beginning of the End for Seattle Seahawks"
- *Seattle Times*: "Seahawks Lost Because of the Worst Call in Super Bowl History"

- The *New Yorker*: “A Coach’s Terrible Super Bowl Mistake”

Although the matter was considered by nearly every pundit as beyond debate, a few outlying voices argued that the play choice was sound, if not brilliant. Benjamin Morris’s analysis on FiveThirtyEight.com and Brian Burke’s on Slate.com convincingly argued that the decision to throw the ball was totally defensible, invoking clock-management and end-of-game considerations. They also pointed out that an interception was an extremely unlikely outcome. (Out of sixty-six passes attempted from an opponent’s one-yard line during the season, zero had been intercepted. In the previous fifteen seasons, the interception rate in that situation was about 2%.)

Those dissenting voices didn’t make a dent in the avalanche of criticism directed at Pete Carroll. Whether or not you buy into the contrarian analysis, most people didn’t want to give Carroll the credit for having thought it through, or having *any* reason at all for his call. That raises the question: Why did *so* many people *so* strongly believe that Pete Carroll got it *so* wrong?

We can sum it up in four words: the play didn’t work.

Take a moment to imagine that Wilson completed the pass for a game-winning touchdown. Wouldn’t the headlines change to “Brilliant Call” or “Seahawks Win Super Bowl on Surprise Play” or “Carroll Outsmarts Belichick”? Or imagine the pass had been incomplete and the Seahawks scored (or didn’t) on a third- or fourth-down running play. The headlines would be about those other plays. What Pete Carroll called on second down would have been ignored.

Carroll got unlucky. He had control over the quality of the play-call decision, but not over how it turned out. It was exactly because he didn’t get a favorable result that he took the heat. He called a play that had a high percentage of ending in a game-winning touchdown or an incomplete pass (which would have allowed two more plays for the Seahawks to hand off the ball to Marshawn Lynch). He made a good-quality decision that got a bad result.

Pete Carroll was a victim of our tendency to equate the quality of a decision with the quality of its outcome. Poker players have a word for this:

"resulting." When I started playing poker, more experienced players warned me about the dangers of resulting, cautioning me to resist the temptation to change my strategy just because a few hands didn't turn out well in the short run.

Pete Carroll understood that his universe of critics was guilty of resulting. Four days after the Super Bowl, he appeared on the *Today* show and acknowledged, "It was the worst *result* of a call ever," adding, "The call would have been a great one if we catch it. It would have been just fine, and nobody would have thought twice about it."

Why are we so bad at separating luck and skill? Why are we so uncomfortable knowing that results can be beyond our control? Why do we create such a strong connection between results and the quality of the decisions preceding them? How can we avoid falling into the trap of the Monday Morning Quarterback, whether it is in analyzing someone else's decision or in making and reviewing the decisions in our own lives?

The hazards of resulting

Take a moment to imagine your best decision in the last year. Now take a moment to imagine your worst decision.

I'm willing to bet that your best decision preceded a good result and the worst decision preceded a bad result.

That is a safe bet for me because resulting isn't just something we do from afar. Monday Morning Quarterbacks are an easy target, as are writers and bloggers providing instant analysis to a mass audience. But, as I found out from my own experiences in poker, resulting is a routine thinking pattern that bedevils all of us. Drawing an overly tight relationship between results and decision quality affects our decisions every day, potentially with far-reaching, catastrophic consequences.

When I consult with executives, I sometimes start with this exercise. I ask group members to come to our first meeting with a brief description of their best and worst decisions of the previous year. I have yet to come across someone who doesn't identify their best and worst *results* rather than their best and worst decisions.

In a consulting meeting with a group of CEOs and business owners, one member of the group identified firing the president of his company as his worst decision. He explained, "Since we fired him, the search for a replacement has been awful. We've had two different people on the job. Sales are falling. The company's not doing well. We haven't had anybody come in who actually turns out to be as good as he was."

That sounds like a disastrous result, but I was curious to probe into why the CEO thought the decision to fire his president was so bad (other than that it didn't work out).

He explained the decision process and the basis of the conclusion to fire the president. "We looked at our direct competitors and comparable companies, and concluded we weren't performing up to their level. We thought we could perform and grow at that level and that it was probably a leadership issue."

I asked whether the process included working with the president to understand his skill gaps and what he could be doing better. The company had, indeed, worked with him to identify his skill gaps. The CEO hired an executive coach to work with him on improving his leadership skills, the chief weakness identified.

In addition, after executive coaching failed to produce improved performance, the company considered splitting the president's responsibilities, having him focus on his strengths and moving other responsibilities to another executive. They rejected that idea, concluding that the president's morale would suffer, employees would likely perceive it as a vote of no confidence, and it would put extra financial pressure on the company to split a position they believed one person could fill.

Finally, the CEO provided some background about the company's experience making high-level outside hires and its understanding of the available talent. It sounded like the CEO had a reasonable basis for believing they would find someone better.

I asked the assembled group, "Who thinks this was a bad decision?" Not surprisingly, everybody agreed the company had gone through a thoughtful process and made a decision that was reasonable given what they knew at the time.

It sounded like a bad result, not a bad decision. The imperfect relationship between results and decision quality devastated the CEO and adversely affected subsequent decisions regarding the company. The CEO had identified the decision as a mistake solely because it didn't work out. He obviously felt a lot of anguish and regret because of the decision. He stated very clearly that he thought he should have known that the decision to fire the president would turn out badly. His decision-making behavior going forward reflected the belief that he made a mistake. He was not only resulting but also succumbing to its companion, hindsight bias. Hindsight bias is the tendency, after an outcome is known, to see the outcome as having been inevitable. When we say, "I should have known that would happen," or, "I should have seen it coming," we are succumbing to hindsight bias.

Those beliefs develop from an overly tight connection between outcomes and decisions. That is typical of how we evaluate our past decisions. Like the army of critics of Pete Carroll's decision to pass on the last play of the Super Bowl, the CEO had been guilty of resulting, ignoring his (and his company's) careful analysis and focusing only on the poor outcome. The decision didn't work out, and he treated that result as if it were an inevitable consequence rather than a probabilistic one.

In the exercise I do of identifying your best and worst decisions, I never seem to come across anyone who identifies a bad decision where they got lucky with the result, or a well-reasoned decision that didn't pan out. We link results with decisions even though it is easy to point out indisputable

examples where the relationship between decisions and results isn't so perfectly correlated. No sober person thinks getting home safely after driving drunk reflects a good decision or good driving ability. Changing future decisions based on that lucky result is dangerous and unheard of (unless you are reasoning this out while drunk and obviously deluding yourself).

Yet this is exactly what happened to that CEO. He changed his behavior based on the quality of the result rather than the quality of the decision-making process. He decided he drove better when he was drunk.

Quick or dead: our brains weren't built for rationality

The irrationality displayed by Pete Carroll's critics and the CEO should come as no surprise to anyone familiar with behavioral economics. Thanks to the work of many brilliant psychologists, economists, cognitive researchers, and neuroscientists, there are a number of excellent books that explain why humans are plagued by certain kinds of irrationality in decision-making. (If you are unaware of these books, see the Selected Bibliography and Recommendations for Further Reading.) But here's a summary.

To start, our brains evolved to create certainty and order. We are uncomfortable with the idea that luck plays a significant role in our lives. We recognize the existence of luck, but we resist the idea that, despite our best efforts, things might not work out the way we want. It feels better for us to imagine the world as an orderly place, where randomness does not wreak havoc and things are perfectly predictable. We evolved to see the world that way. Creating order out of chaos has been necessary for our survival.

When our ancestors heard rustling on the savanna and a lion jumped out, making a connection between "rustling" and "lions" could save their lives on later occasions. Finding predictable connections is, literally, how our species survived. Science writer, historian, and skeptic Michael Shermer, in *The Believing Brain*, explains why we have historically (and prehistorically)