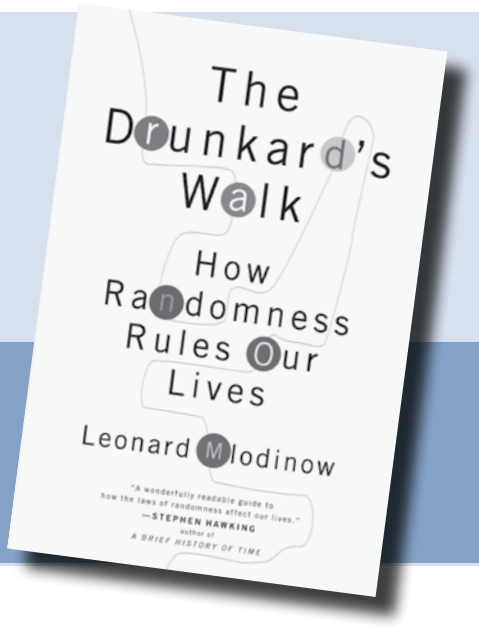
Leonard Mlodinow's The Drunkard's Walk: How Randomness Rules Our Lives

Review by Peter Sephton



As I walked to my office after teaching my last class of the semester –Economic Forecasting, which these days people see more and more as their favorite oxymoron – I overheard two students talking about the final exam in their accounting course. One fellow quite confidently asserted that he would ace the test, since he did so well on his midterms earlier in the year. He based his belief on a simple observation: the night before each exam he ate spaghetti, drank two bottles of Italian beer, and enjoyed a half-litre of Häagen-Dazs ice cream. As long as he kept to his "training routine," he was certain he would be fine and most probably keep his five-figure scholarship. Aside from wanting to suggest he update the data on his lipid profile, I felt a strange mixture of anxiety and jealousy. If only I had discovered those keys to success earlier in life ….

Leonard Mlodinow's *The Drunkard's Walk: How Randomness Rules Our Lives* should be required reading in every postsecondary institution. Although some of the book's insights might be lost on those with limited life experience, at least the accounting student would better understand the true reason for his academic success to this point: he was prepared, he understood the material, and he felt confident – in my experience, the most important determinants of successful test taking (I should know; I recall a reference letter from one of my advisors that, following some initial praise, began a new sentence with "After a very successful career as an exam taker, he has settled down to write a solid, yet somewhat unimaginative piece of applied macroeconomics" – ouch!).

Mlodinow is currently teaching at Caltech after success in both the publishing and entertainment industries. You may have already read *A Briefer History of Time*, which he wrote with Stephen Hawking and which is sometimes referred to as "Hawking for Dummies." Mlodinow's own career is a wonderful example of the major theme of the book – random events affect the paths we follow in life.

Indeed, randomness is everywhere. Interpreting cause and effect is fraught with challenges, so understanding how probability and choice affect outcomes is critical to understanding how things work and to interpreting what we see. All of these are points Mlodinow makes throughout the book. Using "real world" examples – sometimes all too real to the reader – we learn how the science of probability and statistics evolved over time. The book's ten chapters are woven together to

provide a clear understanding of how random events affect our lives – whether it be in terms of whom we marry (or don't), whether that piece of space junk will hit our house (or someone else's), or whether we lead successful and meaningful lives (or not).

Chapter One provides a nice description of mean-reversion. Success and failure might be due to ability, yet in many cases performance tends to return to the mean. That superstar salesperson this year might be next season's flop; the new corporate hire may be the savior of the firm today and a pariah tomorrow. Outstanding professional athletes can perform at sometimes mind-boggling levels, but even their performances cycle up and down, around that higher mean. Human resources managers take note – does the stick work better than the carrot? Do performance reviews raise the average level of performance, or simply exacerbate the swings?

The second chapter discusses concepts in probability theory with a smattering of examples from the legal field to help the reader understand joint and marginal probabilities. It also begins to sow the seeds of how psychology affects our interpretation of what we see – or think we see – and its interaction with how we interpret information.

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The third chapter tells us to remember to understand the concept of sample space – all the possible outcomes that might occur – and how they affect probability measures of individual, joint, and conditional events. Here's where Mlodinow introduces the classic "Monty Hall" problem from the TV game show Let's Make a Deal (always a thriller in first-year statistics courses). You probably recall the predicament the show's contestants found themselves in: Hall, the emcee, gives you three doors to choose from, each door concealing a prize or prizes that vary widely in value. Once you've chosen a door from the offered three options, Monty reveals what's behind one of the doors you did not choose, and gives you the opportunity to switch. Should you? Yes: the odds are in your favor if you do. Why? Read the book, or go to this handy applet to run some experiments: *www.nytimes.com/2008/04/08/science/08monty.html.*

Chapter Four deals with linking the sample space to the probability of each event in the space so that we can form a mathematical expectation of the outcome of our decisions. Economists love calculating expected values (the mean of the possible outcomes) and use them to explain why we risk that $20 parking ticket rather than feed the meter with a quarter. There's also quite a bit on the history of mathematics in this chapter, and this historical context is neatly woven throughout the book. For those of us who think "math is fun, math is our friend," this stuff is like chateaubriand – even those whose brains aren't wired for math and statistics will have to agree that Mlodinow makes the material accessible.

Generating random numbers and interpreting the outcomes of games of chance are covered in Chapter Five. Just because your investment broker generated six years of above-market performance, it doesn't mean that trend will continue (although it may). Parking without putting a quarter in the meter probably will work for a while, but at some point you're going to find a ticket stuck under your wiper blade. You might feel lucky – and maybe you are – but in Vegas, I'd still walk away from that slot machine. Some casinos, in an effort to make your life "easier," have eliminated money and tokens altogether. You place your customer card into the slot machine and hit the buttons – but if you had planned on gambling

(i.e., losing) only $20 and keeping count of that $20 separate from your winnings, you'll need a clear head (or a calculator) the next time you visit the slots – and heaven help you if you've had a drink or three.

Bayes' theorem on conditional probability, the concept of variance, and the normal distribution follow in subsequent chapters. All of these lead up to the final chapter, The Drunkard's Walk, which, in time series modeling, has revolutionalized how we build our models. Many economic time series appear to be random, yet they may be drawn together over time by long-run attractors, or "equilibrating relationships." Consider the prices of strawberries in Maine—let's say in Kittery and in Freeport. If we plotted the series, we might believe them to be moving randomly, yet we know arbitrage across markets will draw the prices together over time (otherwise, we can buy berries where they are less expensive and drive them to the higher-priced market and make a profit). This is the concept of cointegration analysis for which Clive W.J. Granger and Robert F. Engle received the Nobel Prize in Economics in 2003.

Engle and Granger devised a method for testing whether a linear combination of random variables generated another random variable or a series that was mean-reverting. Mean-reversion suggests those variables that appeared to be randomly moving through time were actually drawn together by some equilibrating relationship or, as I like to tell students, some "unknown force" (which usually comes from theory). Telling students there are "unknown forces" affecting economic relationships engenders a sense of wonderment and curiosity – more so than perhaps simply telling stories from the "dismal science." When variables are cointegrated, then our forecasting models need to recognize the long-run attractors constraining their behavior over time. Forecasting models that incorporate those long-run restrictions perform better than those that ignore the cointegrating relationship. For an accessible exposition of the concept of cointegration, see Michael Murray's 1994 article in *The American Statistician* "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction," a pdf of which is available at *http://www-stat.wharton.upenn.edu/~steele/Courses/434/434Context/Co-integration/Murray93DrunkAndDog.pdf*

"Nothing in this world can take the place of persistence. Talent will not; nothing is more common than unsuccessful people with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan 'Press on' has solved and always will solve the problems of the human race."

Calvin Coolidge

Mlodinow demonstrates that many things we observe are the result of randomness. Whether it be the degree of success or failure in our careers, where and with whom we live, or how many Nobel prizes we will win (or have won!), random events affect our lives.

As a result, perhaps the most encouraging note Mlodinow provides is that no matter the degree of our success or failure, we need to keep trying; we need to soldier on. Randomness means that, if we do keep trying, we're bound to be a winner one day. Persistence pays off precisely because the more times we try, the more opportunities we have to be successful. You can't hit the jackpot in the lottery if you don't buy a ticket—or, as the old New York Lottery Commission tagline put it, you have to be in it to win it.

Perhaps Calvin Coolidge, the 30th president of the United States, understood this when he said:

"Nothing in this world can take the place of persistence. Talent will not; nothing is more common than unsuccessful people with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan 'Press on' has solved and always will solve the problems of the human race."

Leonard Mlodinow, *The Drunkard's Walk: How Randomness Rules our Lives*
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Bio: Peter Sephton, a member of *Foresight*'s Editorial Board, is Professor of Managerial Economics at Queen's School of Business in Ontario and former director of Queen's National Executive MBA program. He is an economist with expertise in monetary policy and applied economic modeling and has held visiting appointments at the International Monetary Fund and the Federal Reserve Bank of St. Louis. See Peter's article on forecasting economic recessions in the Winter 2009 issue of *Foresight*.

Even we economic forecasters need to just keep trying. As Nobel laureate Paul Samuelson once said, "If you must forecast, forecast often."

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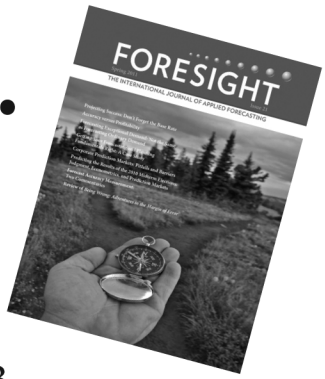

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