

Risks & Rewards

Actuaries

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ARE WE FOOLED BY RANDOMNESS?

By Steve Scoles

Paul Depodesta, former assistant general manager of the Oakland A's baseball team tells a funny story about the news media:

In 2003, the A's star shortstop and previous year's league MVP Miguel Tejada was in his final year of his contract. Being a small market team with relatively low revenue, the A's decided that they simply did not have the money to sign Tejada to a new contract. Rather than have season-long uncertainty around the contract negotiations, they decided to tell Tejada and the media during spring training that while they would like to have Tejada on the team after the end of the season, they were simply not in a position to sign him to a new contract.

So, for the first six weeks of the season, Tejada's overall performance is poor and he has a batting average around .160. The media starts asking Depodesta if it's because Tejada doesn't have a contract. After being pushed several times, Depodesta tells the media that Tejada's performance likely has nothing to do with the contract and that he bets that by the end of the season, Tejada will have about the same production numbers as he did the last couple of years. But the media didn't bite. They continued to insist that Tejada was playing poorly because he didn't have a contract.

Lo and behold later in the season, Tejada picks up his play and his year-to-date statistics are pretty similar to those he racked up in previous years. One of the reporters who had hounded Depodesta earlier called him and asked, quite seriously, "Tejada's really picked it up. Do you think it's because he doesn't have a contract?"

This story illustrates how the media and its readers (me included) often try to find meaning in what is likely just noise. That is, we can get fooled by randomness.

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FOOLED BY RANDOMNESS

Fooled by Randomness is actually the title of a book written by Nassim Nicholas Taleb (who also wrote the recent best-seller *The Black Swan*). Taleb explores real-world randomness in the markets and in life ... not the text book version we learn in our actuarial exams. Taleb, a former derivatives trader, shows the many dimensions of how we are constantly deceived by randomness.

Just one of the many aspects he covers is how we find “patterns” or stretch for meaning in what is really random data and how the news media helps us along in this process.

FINDING PATTERNS

One of the experiments Taleb notes in his book is an experiment the famous psychologist B.F. Skinner conducted with pigeons. The pigeons were placed in a large box and were delivered food on a completely random basis through a small opening.

Skinner was astonished to find that almost all of the birds developed an “extremely sophisticated rain-dance type of behavior” at feeding times. They displayed specific rituals such as moving their heads in a certain way that was related to their feedings. Even birds appeared to form links between their behavior and random information!

Other experiments have shown humans can find “patterns” in random data, even to the point of being insistent on their “patterns” after the experiment is concluded and they are shown that the data was random. As Taleb notes, “our bias is immediately to establish a causal link.”

In Taleb’s latest book, *The Black Swan*, he notes how psychologists have shown that theorizing (i.e., find-

ing patterns) is an automatic behavior just like, say, breathing. That is, not theorizing requires effort. As Taleb summarizes, “It is almost impossible for our brains to see anything in raw form without some interpretation.”

Much like the Oakland A’s sports reporter had to link a baseball player’s short-term poor play with something else that was happening, it is difficult for us to view things as independent.

To be clear, our amazing pattern-identifying abilities are critical to almost everything we do. It’s just that in certain situations, these tools can fail us.

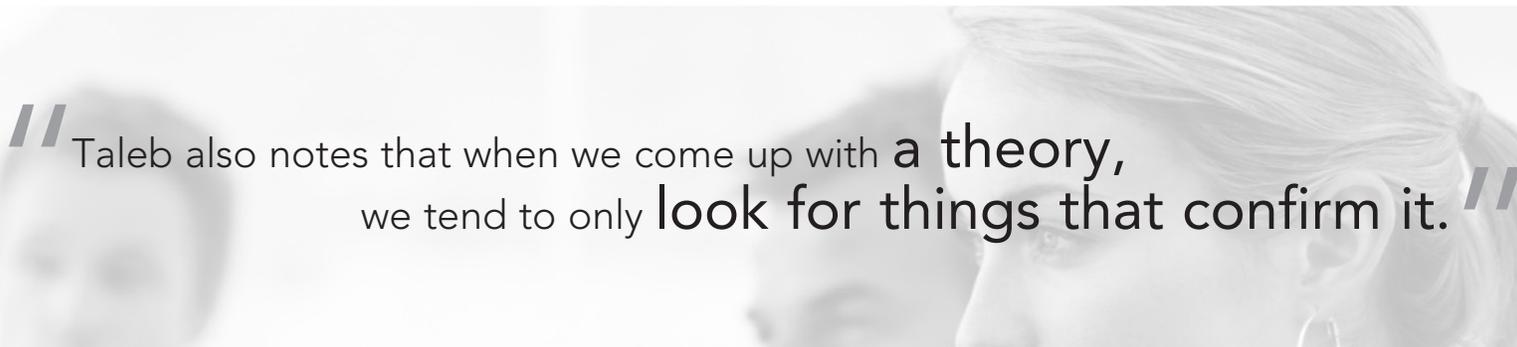
WE SEE WHAT WE WANT TO SEE

Taleb also notes that when we come up with a theory, we tend to only look for things that confirm it (also known as confirmation bias). The following experiment noted in *The Black Swan* illustrates this concept:

Subjects were given a sequence and were asked to determine the underlying generating process for it. The subjects could give the experimenters other sequences and would be told whether or not it fit the underlying process. The sequence given to the subjects was 2, 4, 6.

Almost all of the subjects quickly concluded the series was “increasing by 2.” The actual answer was simply “an increasing series.” But under repeated trials, very few subjects tested sequences that went against their original theories.

Taleb observes that “once your mind is inhabited with a certain view of the world, you will tend to only consider



“Taleb also notes that when we come up with a theory, we tend to only look for things that confirm it.”

instances proving you to be right.” So not only are we quick to come up with theories, we also tend to focus only on evidence that proves those theories.

FINANCIAL MEDIA

Now let’s turn to the financial media. Every market day, Yahoo! Finance, one of the world’s most used sources of financial information, explains what happened in the day’s markets. I picked three consecutive days in April of this year where the S&P 500 index barely moved at all (average market moves would be several times more than the moves on these days). In fact, the cumulative change for these three days was almost flat at about +0.02 percent.

Date	Headline	S&P500
April 2	Stocks Decline as Oil Price Spike Causes Worries About Consumer Spending, Economy	-0.19%
April 3	Stocks Up after Comments From Fed Chairman, Merrill CEO Revive Confidence About Credit Markets	+0.13%
April 4	Most Stocks Up After Report of 80,000 Jobs Lost in March; Some Investors Feared Bigger Decline	+0.08%
Cumulative		+0.02%

Note: The average absolute daily S&P500 change over the preceding 12 months was 0.91 percent.

As you can see, even only very slight changes in the S&P 500 index can provoke dramatic headlines. The stretch for meaning in noise seems apparent in the financial media as well.

As an interesting aside, the apparent cause for the April 2 decline in the S&P—the spike in the price of oil—receives no mention in the later headlines. This is surprising given that the price of oil had a very similar spike on April 4 which put the price 2 percent higher than on April 2. I guess that piece of data did not help explain the S&P500 increase on April 4—perhaps that data didn’t fit the theory!

To be fair, the dramatic headlines and explanations from the media are also related to the incentives they have. As Taleb states, “the media is paid to get your attention.”

COMPLEX SYSTEMS

Another ingredient that complicates arriving at simple explanations in areas such as sports and markets is the complexity of the systems. Complex systems, such as sports and the market, emerge from the interaction of many individual components. In other words, for every outcome, there are a large number of inputs. A key characteristic of complex systems is the linking between cause and effect—that can be very difficult.

Paul Depodesta explains the complexity of a baseball game: “just imagine one at-bat, there is the pitcher, the catcher, the hitter, what pitch will be thrown, and how the fielders are playing.” And that doesn’t include all of the things leading up to that at-bat such as recent performance.

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The markets have orders of magnitude that are much more complex than baseball. However, the financial media are often trying to distill the interactions of millions of participants down to a quick sentence or two.

ARE WE FOOLED BY RANDOMNESS?

Randomness pervades many arenas including sports and markets. Our mind's inherent desire to find patterns or to link cause and effect can fail when it interacts with these

types of complex systems. This is not to say that everything is random or to encourage one to be fooled into randomness when it is not there. Instead, it is to point out that our great ability to find meaning can become a rather blunt and misleading tool in certain circumstances. Be wary the next time you read the sports or financial headlines. At least that's my theory, and all of the evidence I'm willing to consider supports it. 📌



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