What I Wish I Knew When I Was 17

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Flame University
January 9, 2021

 # 1:

Just how powerful some of the ideas that are taught in academia are, just how useful they are in making decisions and for understanding how the world really works;

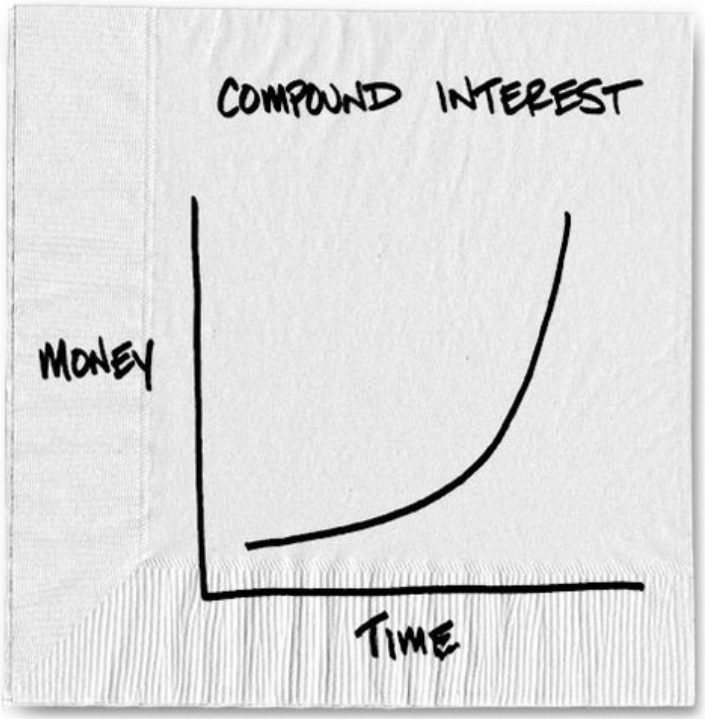
2:
How becoming a wiser person over time requires application of these ideas;

3:
That these ideas will come from multiple disciplines and you will have to learn to be a broad thinker by picking up the best ideas from multiple disciplines;

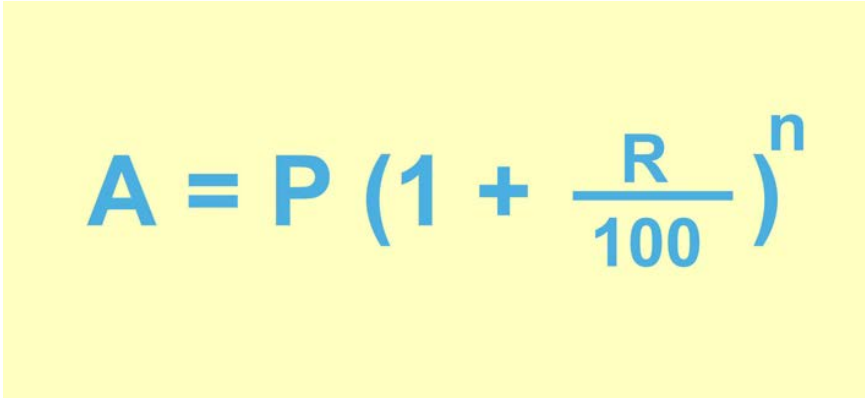
4:
How you only need a handful of key ideas from key disciplines to really understand how the world really works; and

5:
How these ideas often combine to produce stunning outcomes

Idea # 1:
Compound Interest



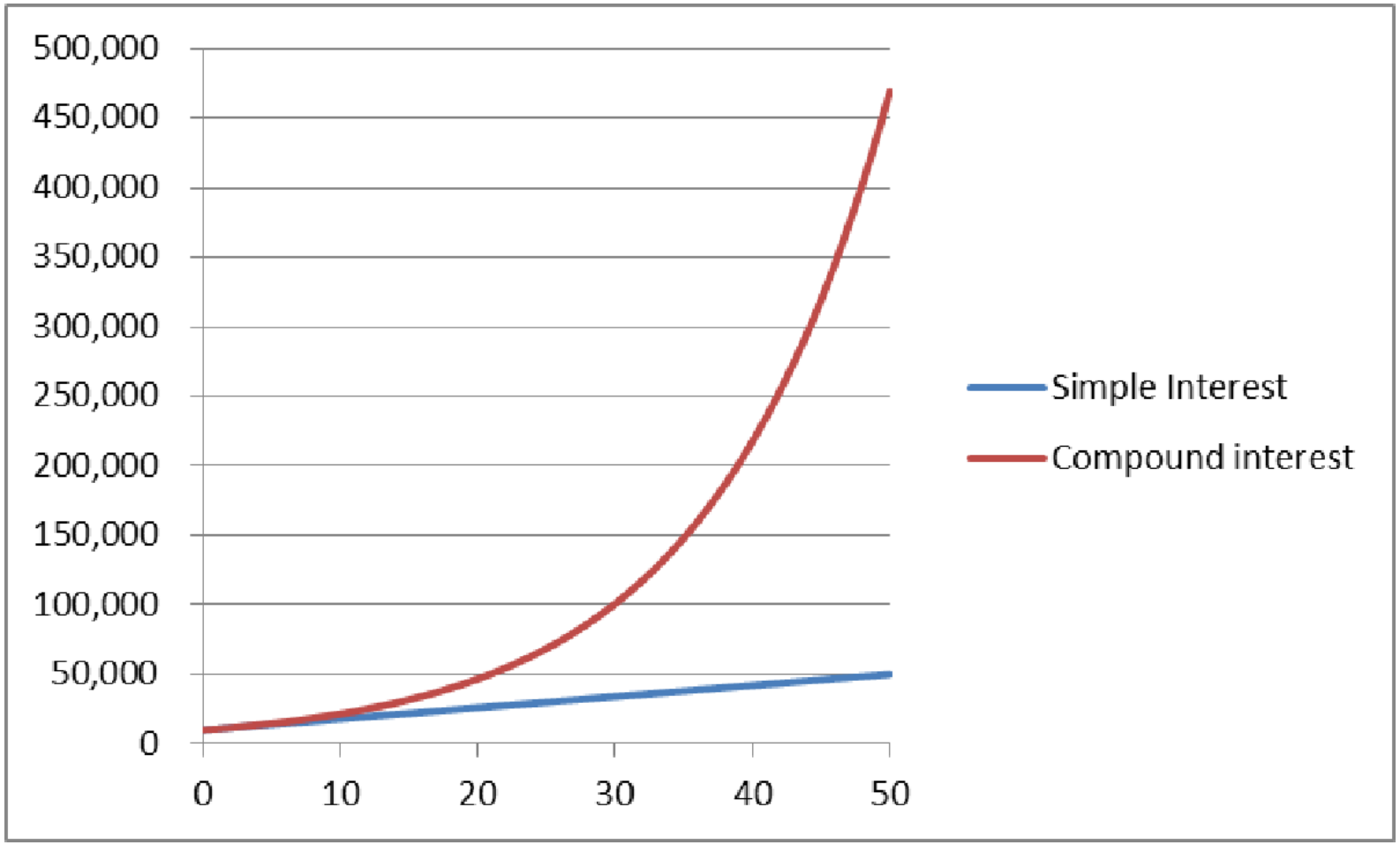
$$A = P\left(1 + \frac{R}{100}\right)^{n}$$



100 × (1.10)^30 = 1,745

100 × (1.14)^30 = 5,095

5,095/1,745 = 2.9x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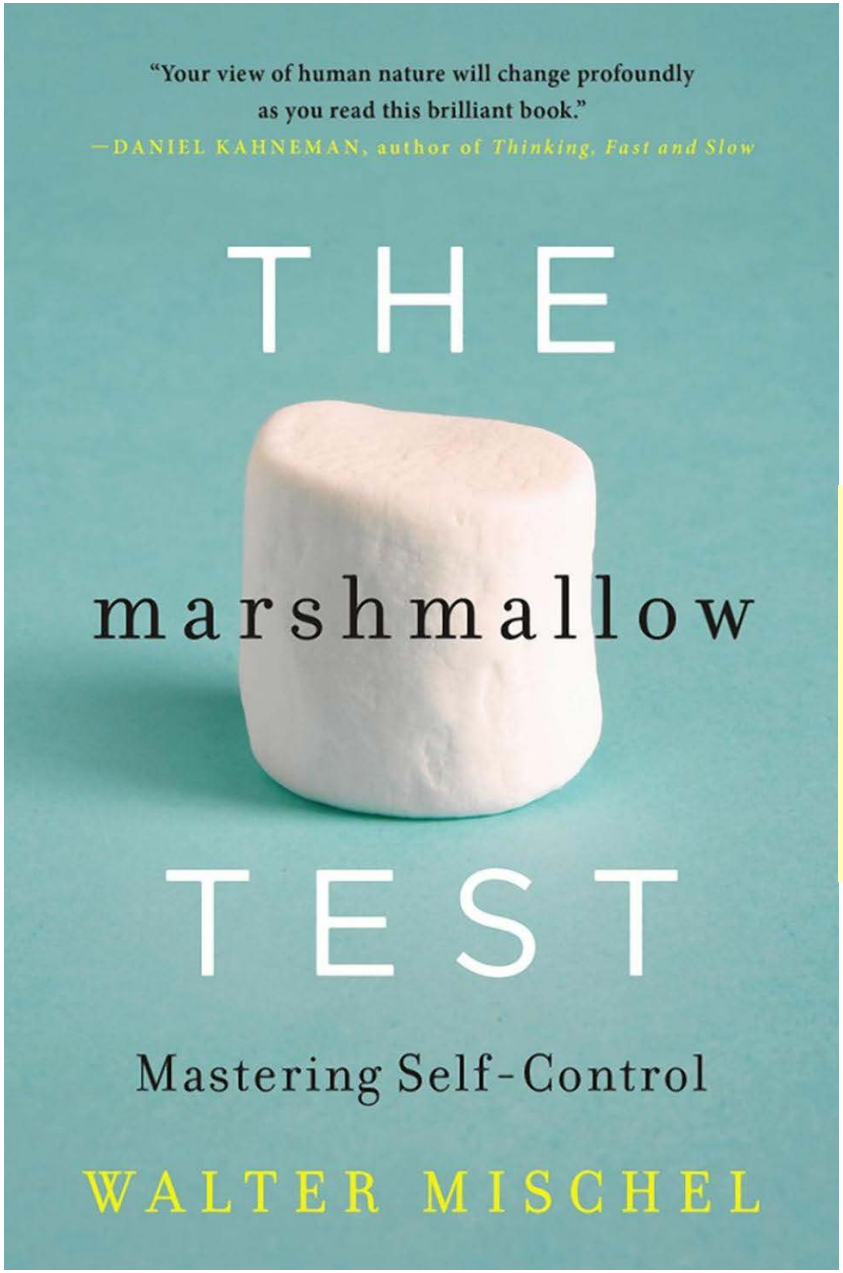
Simple Interest
Compound interest

Example: Delayed Gratification



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- Let P be your starting position
- Let R be the outcome of effort you put in over time - this should rise over time if you are any good, right? So, R is not a constant

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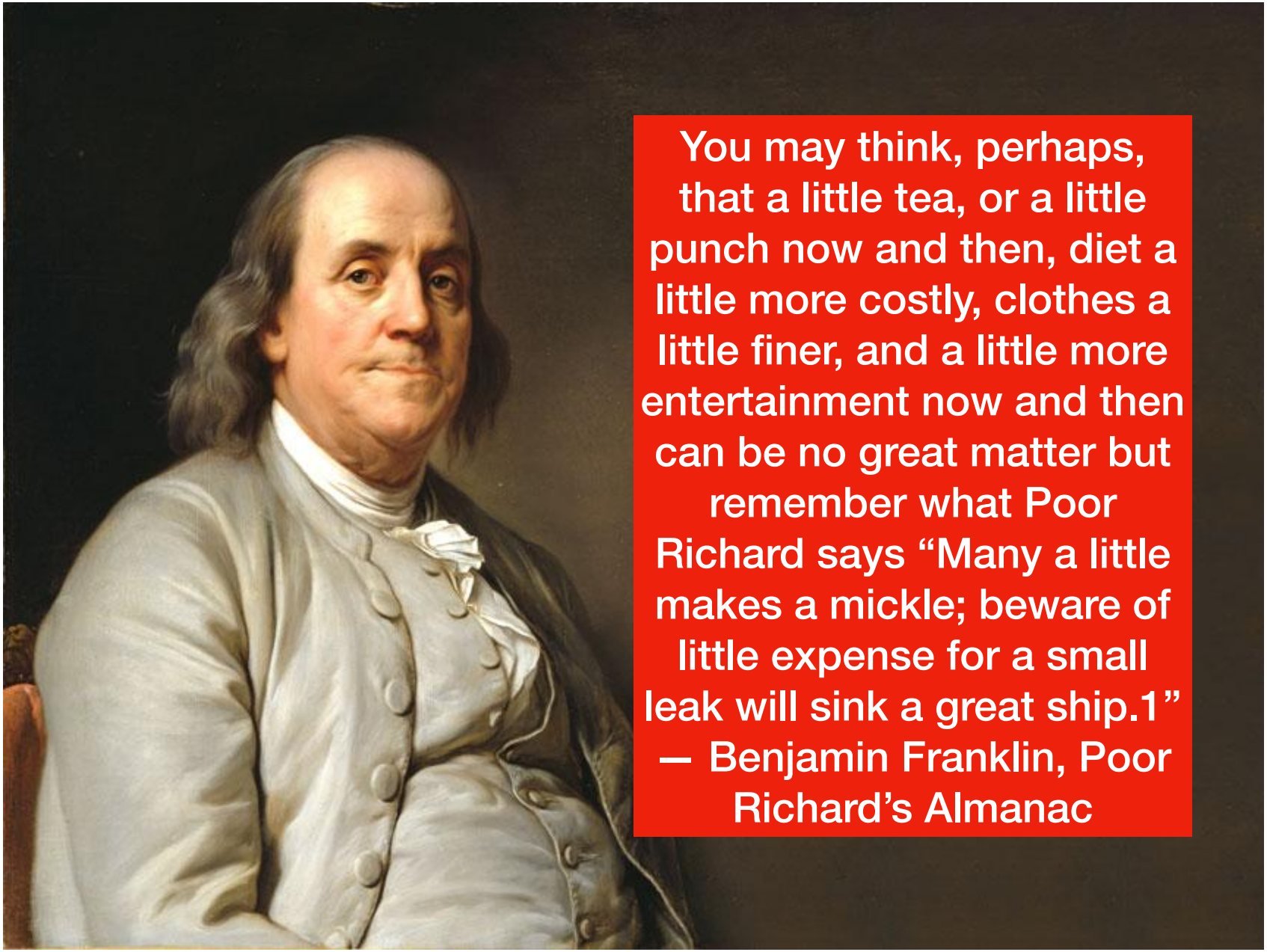
- Let A be the eventual outcome you desire
- Let P be your starting position
- Let R be the outcome of effort you put in over time - this should rise over time if you are any good, right? So, R is not a constant
- Let n be the period over which you put in the effort

Example: Frugality


You may think, perhaps, that a little tea, or a little punch now and then, diet a little more costly, clothes a little finer, and a little more entertainment now and then can be no great matter but remember what Poor Richard says “Many a little makes a mickle; beware of little expense for a small leak will sink a great ship.1”
— Benjamin Franklin, Poor Richard’s Almanac

"It is easier to suppress the first desire than to satisfy all that follow it." — Benjamin Franklin, Poor Richard's Almanac

$$A = P\left(1 + \frac{R}{100}\right)^{n}$$

“Life is like a snowball, all you need is wet snow and a really long hill.” — Warren Buffett


THE FRENCH NOTE
AMBER ORANGE
SPECIAL COLLECTION
SHAMPOO
shampooing
SOFITEL
HOTELS & RESORTS
MUMBAI BKC


FOREST ESSENTIALS
Conditioner
Lime, Tulsi & Narangi
specially blended for
Oberoi Hotels & Resorts
50 ml e 1.7 fl.oz.


SEAWEED
THERAPY
CROWNE PLAZA
HOTELS & RESORTS


THE FRENCH NOTE
WHITE TEA
COLLECTION
SOAP
lavender · peppermint formula
BIGELOW
ESSENZA DI WILLS
AQUA
THE
SHAMPOO
TULSI & KAMA
KAMA

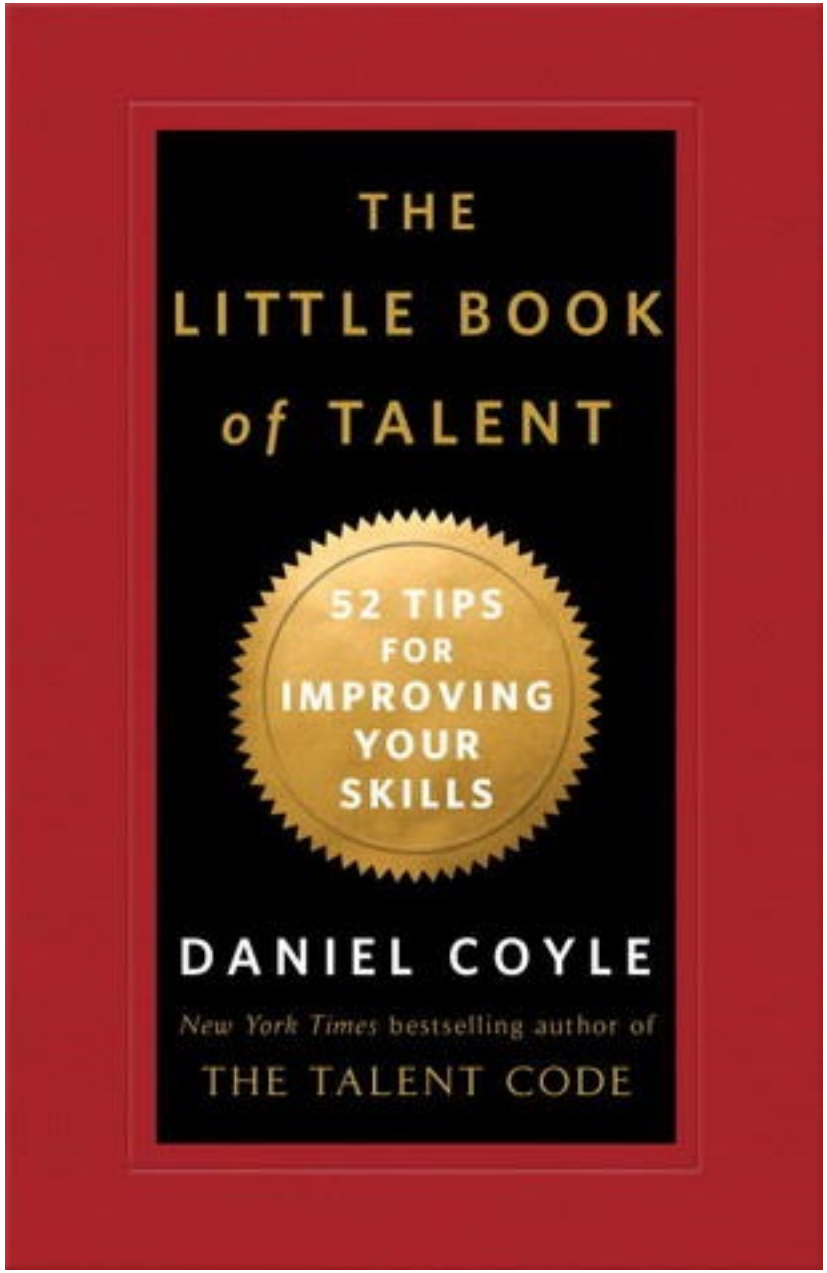
Example: Tradeoffs

$$A = P\left(1 + \frac{R}{100}\right)^{n}$$

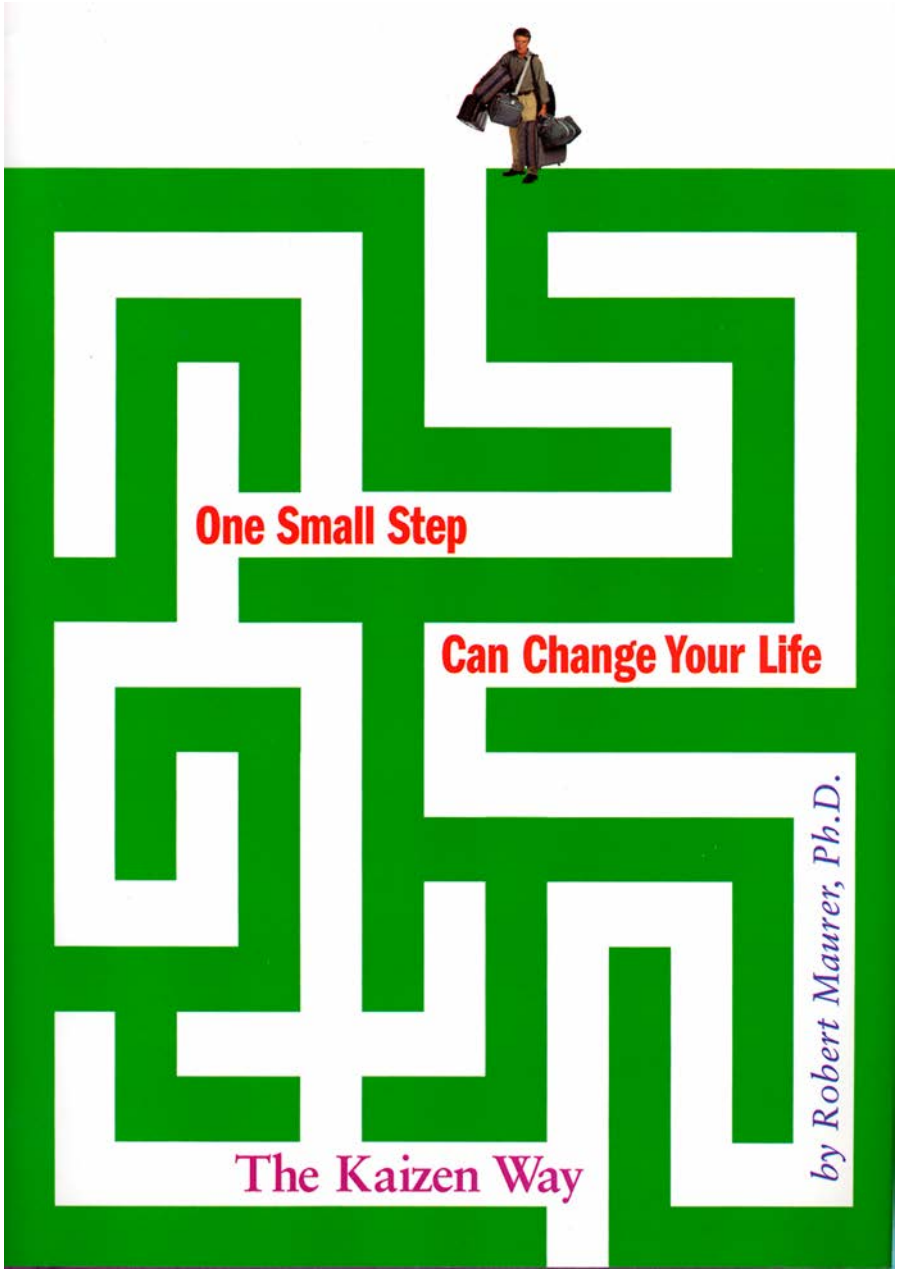
The farmer who killed the goose that laid the golden eggs

$$A = P\left(1 + \frac{R}{100}\right)^{n}$$

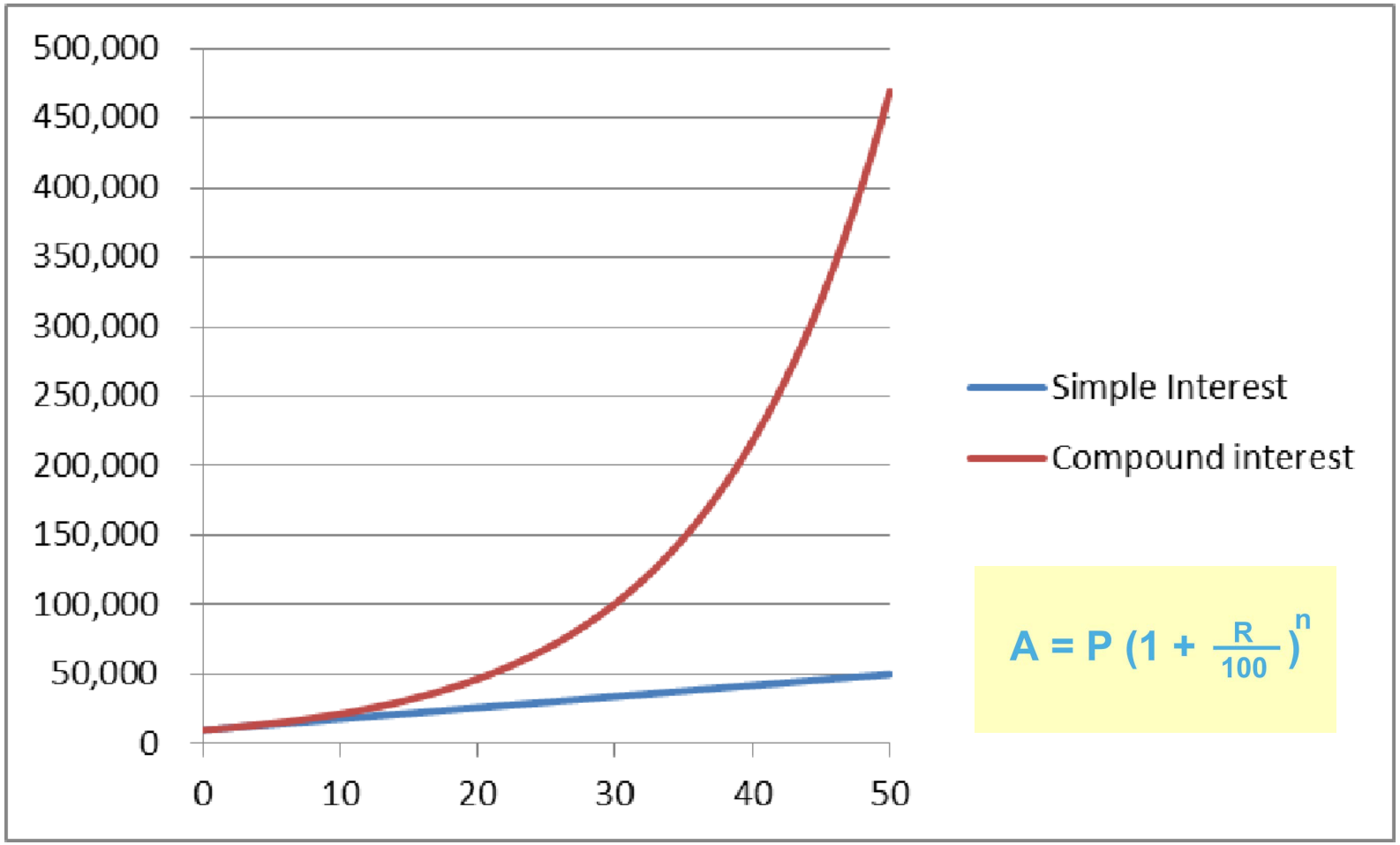
$$A = P\left(1 + \frac{R}{100}\right)^{n}$$


THE
LITTLE BOOK
of TALENT
52 TIPS
FOR
IMPROVING
YOUR
SKILLS
DANIEL COYLE
New York Times bestselling author of
THE TALENT CODE


New York Times bestselling author
DANIEL COYLE


One Small Step
Can Change Your Life
The Kaizen Way
by Robert Maurer, Ph.D.

"When you improve a little each day, eventually big things occur. When you improve conditioning a little each day; eventually you have a big improvement in conditioning. Not tomorrow, not the next day; but eventually a big gain is made. Don't look for the big, quick improvement. Seek the small improvement one day at a time. That's the only way it happens-and when it happens, it lasts." -John Wooden, one of the most successful coaches in the history of college basketball.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Simple Interest
Compound interest
A = P (1 + R/100)^n

Idea # 2:
Proof by Contradiction

Suppose $\sqrt{2}$ is **rational.** That means it can be written as the ratio of two integers p and q

$$\sqrt{2} = \frac{p}{q} \tag{1}$$

where we may assume that p **and** q **have no common factors**. (If there are any common factors we cancel them in the numerator and denominator.) Squaring in (1) on both sides gives

$$2 = \frac{p^2}{q^2} \tag{2}$$

which implies

$$p^2 = 2q^2 \tag{3}$$

Thus p^2 is even. The only way this can be true is that p itself is even. But then p^2 is actually divisible by 4. Hence q^2 and therefore q must be even. So p and q are both even which is a contradiction to our assumption that they have no common factors. The square root of 2 cannot be rational!

Reductio ad absurdum

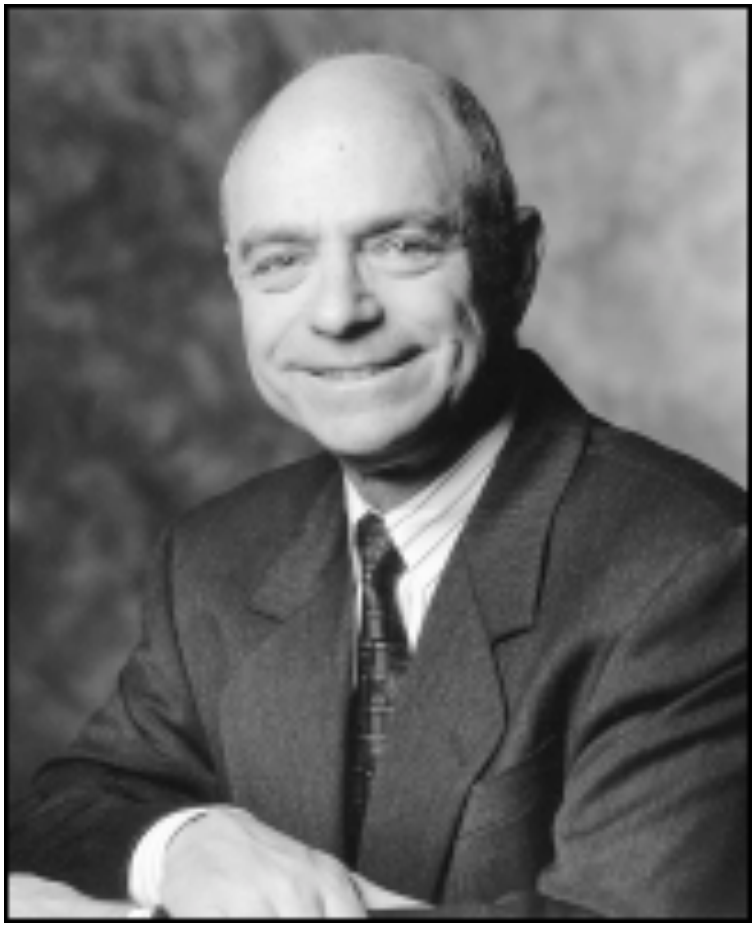
A form of argument that attempts to disprove a statement by showing it inevitably leads to a ridiculous, absurd, or impractical conclusion

Example # 1: Buffett on Absurdity of Dotcom Valuation

Warren Buffett

Warren Buffett

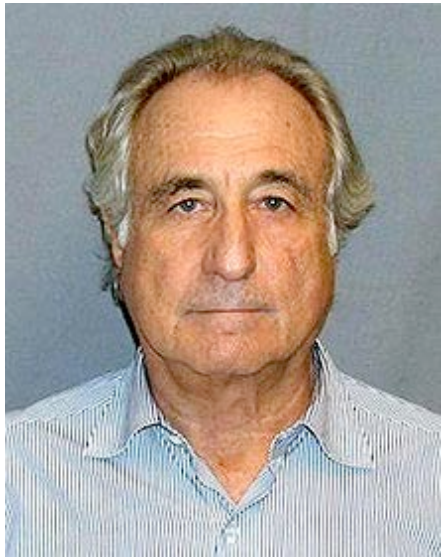
Example # 2: Ralph Wanger on Disk Drive Industry



Ralph Wanger

Example # 3: Harry Markopolos on Absurdity of Bernie Madoff's Investment Returns

Harry Markopolos



Bernie Madoff


60
MINUTES
0:00
-13:48

The World's Largest Hedge Fund is a Fraud

November 7, 2005 Submission to the SEC
Madoff Investment Securities, LLC
www.madoff.com

There are 2 possible scenarios that involve fraud by Madoff Securities:

1. Scenario # 1 **(Unlikely):** I am submitting this case under Section 21A(e) of the 1934 Act in the event that the broker-dealer and ECN depicted is actually providing the stated

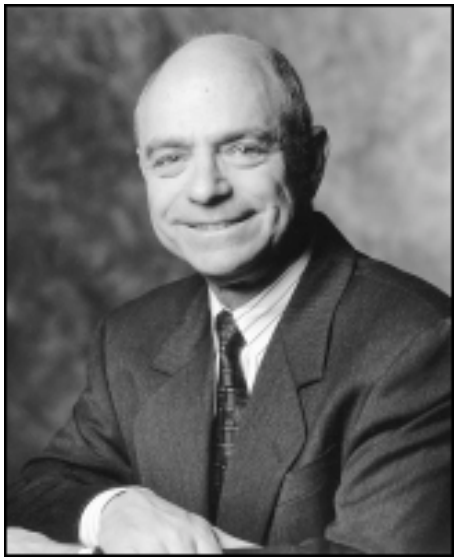
   returns to investors but is earning those returns by front-running customer order flow. Front-running qualifies as insider-trading since it relies upon material, non-public information that is acted upon for the benefit of one party to the detriment of another party. Section 21A(e) of the 1934 Act allows the SEC to pay up to 10% of the total fines levied for insider-trading. We have obtained approval from the SEC's Office of General Counsel, the Chairman's Office, and the bounty program administrator that the SEC is able and willing to pay Section 21A(e) rewards. This case should qualify if insider-trading is involved.

2. Scenario # 2 **(Highly likely)** Madoff Securities is the world's largest Ponzi Scheme. In this case there is no SEC reward payment due the whistle-blower so basically I'm turning this case in because it's the right thing to do. Far better that the SEC is proactive in shutting down a Ponzi Scheme of this size rather than reactive.

Proof by Contradiction

Red Flag # 4: *$9.017 billion in total OEX listed call options outstanding is not nearly enough to generate income on BM's total amount of assets under management which I estimate to range between $20 - $50 billion. Fairfield Sentry Ltd. alone has $5.1 billion with BM. And, while BM may say he only uses Over-the-Counter(OTC) index options, there is no way that this is possible. The OTC market should never be several times larger than the exchange listed market for this type of plain vanilla derivative.*

Warren Buffett



Ralph Wanger

Harry Markopolos

“How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?”

Falsification is Powerful Way to Think

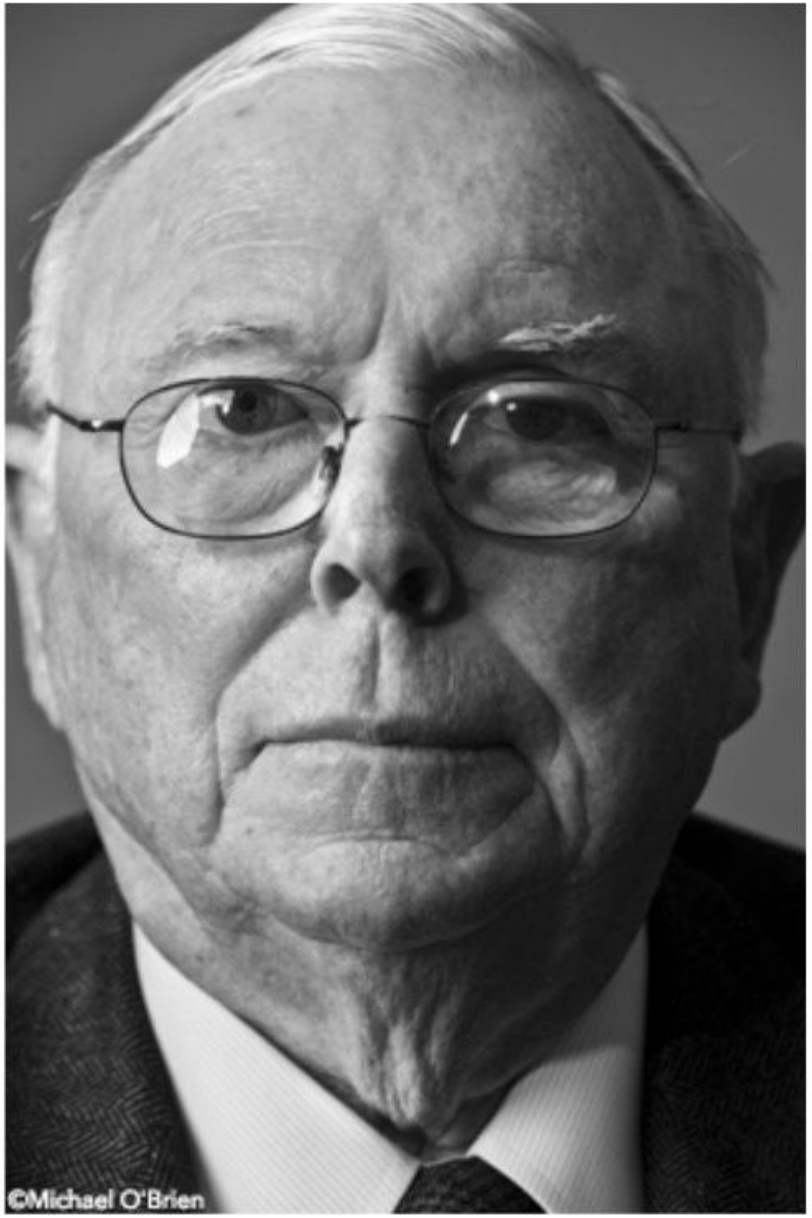
Idea # 3:
Reductionism

Example of Reductionism

$$30x + 10y = 90$$

divide both sides by 10

$$3x + y = 9$$

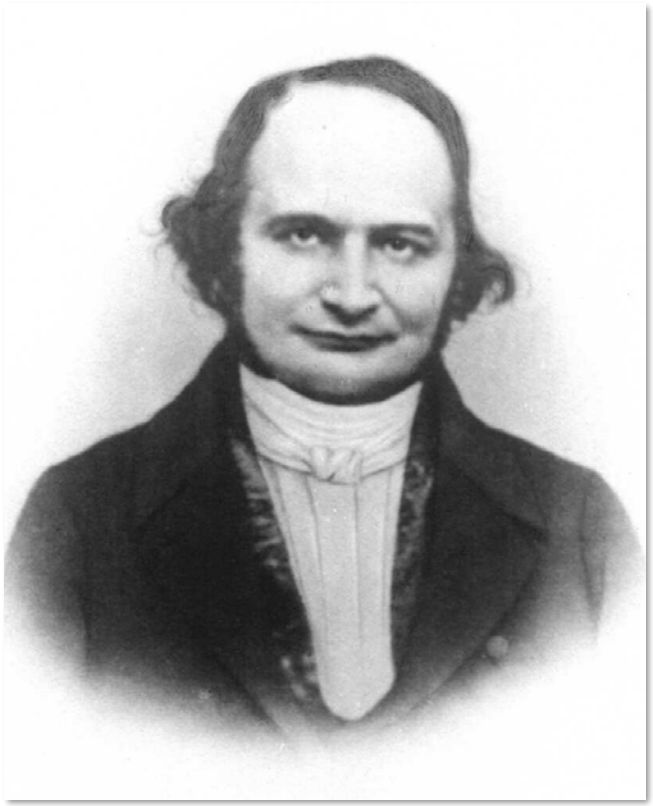


You can never make any explanation that can be made in a more fundamental way in any other way than the most fundamental way.

Idea # 4:
Inversion

Example:

What is the Probability of Landing Heads at Least Once in 10 Coin Flips



“Invert, always invert.” — Carl Jacobi

Equation 1:

$$20x + 10y = 5x + 8y + 10$$

By using inversion by moving terms on right hand side to left hand side of the equation, leaving one term only on left hand side, we get

$$(20x - 5x) + (10y - 8y) = 10$$

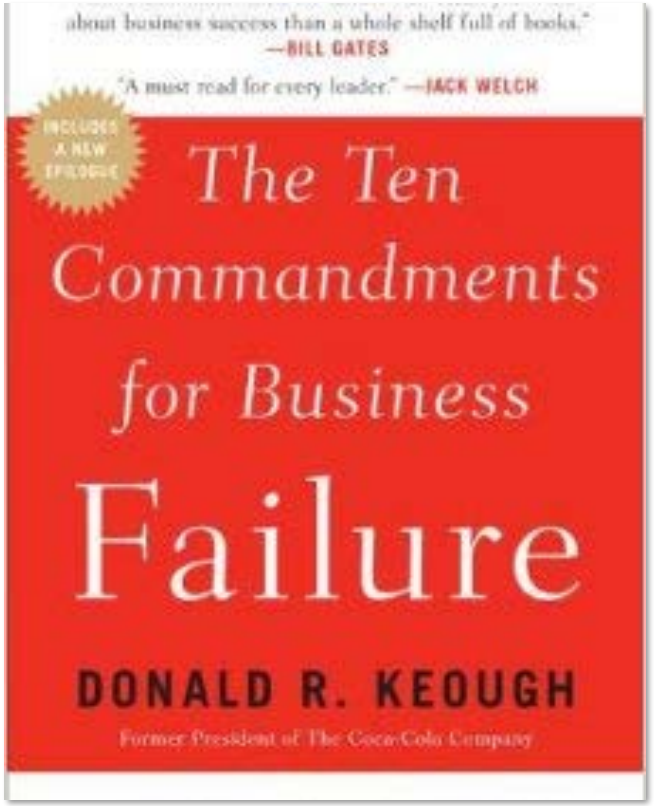
And we end up with the

Reduced Equation:

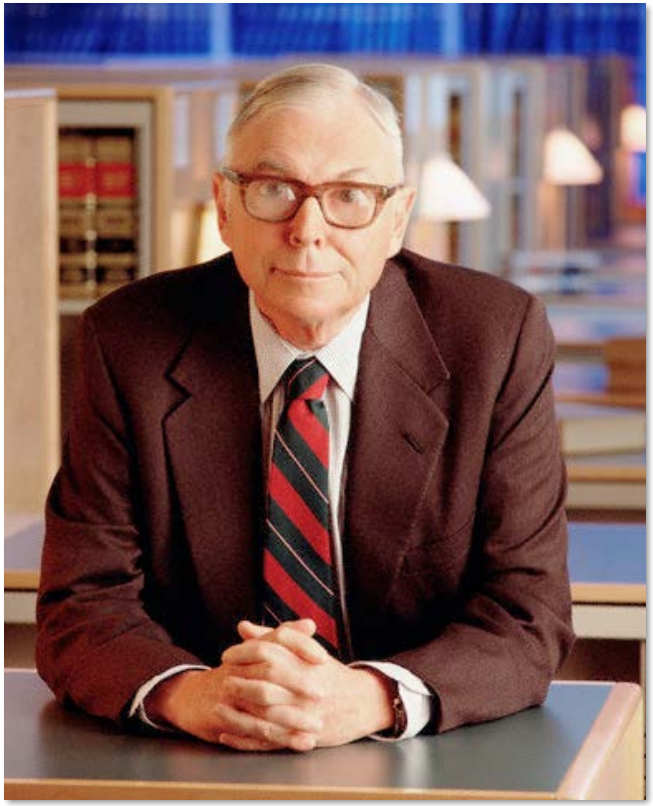
$$15x + 2y = 10$$

Example: Ask, How to Fail?

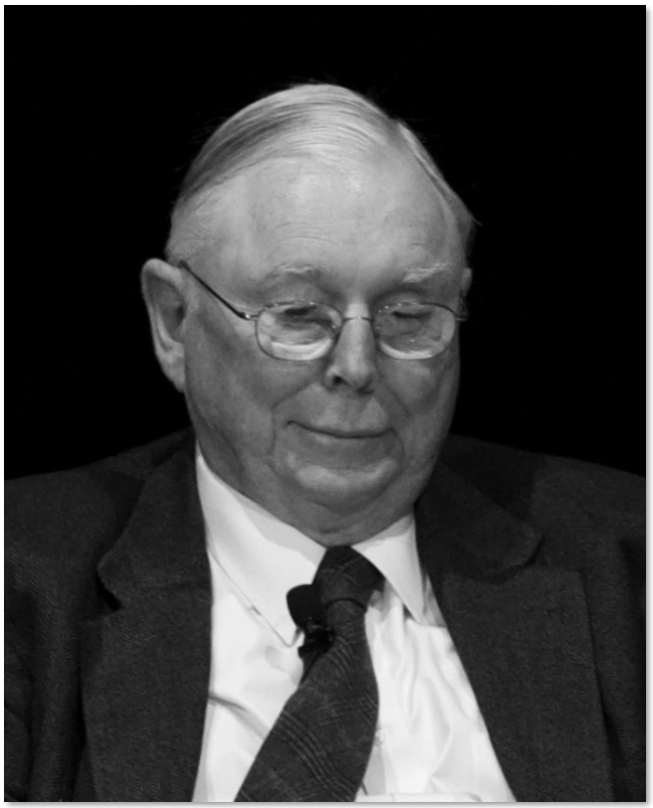
Then Don’t Do Those Things



"Instead of thinking how to make your business better, think how to ruin it, and then simply avoid those things."



"We should make a list of everything that irritates the customer, and then we should eliminate those defects one by one. That is the way to compete in the service business."



"All I want to know is where am going to die, so I never go there." — Charlie Munger

Example: Avoid Dumb Behavior

“You don’t have to pee on an electric fence to learn not to do it.” — Charlie Munger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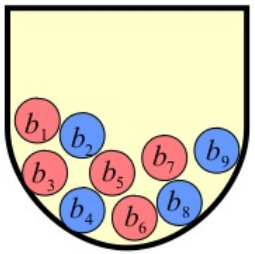
Idea # 5:
Small Probabilities, Large Consequences

Example 1: Balls-and-Urn

- Suppose an urn contains 4 blue balls and 5 red balls.
- An example **experiment:** Shake up the urn, reach in (without looking) and pull out a ball.
- A **random variable** V: Identity of the chosen ball.
- The **sample space** S: The set of all possible values of V:
  - In this case, $S = \{b_1,\ldots,b_9\}$
- An **event** E: "The ball chosen is blue": $E = \{$ _____ $\}$
- What are the odds in favor of E?
- What is the probability of E?



Let Us Play A Game

I toss a coin

If it lands HEADs I will pay you Rs 50 lacs

If it lands TAILS you will pay me Rs 10 lacs

WILL YOU PLAY?

The Game

I toss a coin

If it lands HEADs I will pay you Rs 50 lacs

If it lands TAILS you will pay me Rs 10 lacs

WILL YOU PLAY?

Expected Value of the Game

Outcome	Probability	Win/Loss	Expectation
Heads	50%	₹ 5,000,000	₹ 2,500,000
Tails	50%	-₹ 1,000,000	-₹ 500,000
		Expected Value of Game	**₹ 2,000,000**

A Game

I toss a coin

If it lands HEADs I will pay you Rs 50 lacs

If it lands TAILS you will pay me Rs 10 lacs

Your net worth is Rs 10 lacs

Now WILL YOU PLAY?

Rephrasing This Game

Will you take a 50 percent chance of a wipeout?

What about 20 percent

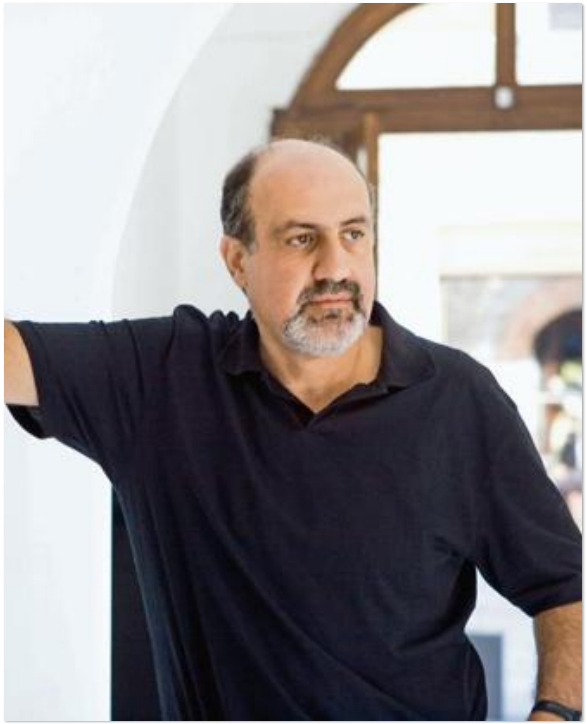
Will you take a 20 percent chance of wipeout?

What about a 1 percent chance

Will you take a 1 percent chance of a wipeout?

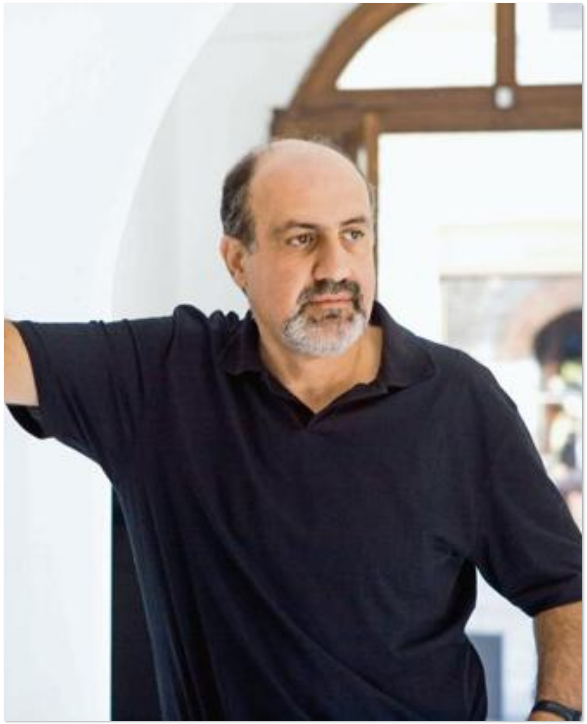
What Is the Big Lesson

You do not take the risk of ruin no matter how good the upside



Nassim Taleb

In a strategy that entails ruin benefits never offset risks of ruin



Nassim Taleb

It is irrational to separate risk taking from the risk management of ruin


AMMOLAND

Anil Ambani, Reliance Power, Reliance Infrastructure, Reliance Capital,

Naresh Goyal, Jet Airways

Kishore Biyani, Future Group

C.P. Krishnan Nair, Hotel Leelaventure

Gautam Thapar, BILT, Crompton Greaves, CG Power

G.M. Rao, GMR Group

Subhash Chandra,
Zee Entertainment

Jaiprakash Gaur, Jaypee Group

Vijay Mallya, United Breweries,
United Spirits, Kingfisher Airlines

Sanjay Chandra, Unitech

Tulsi Tanti, Suzlon

V. G. Siddhartha, Cafe Coffe Day

It takes 20 years to build a reputation and five minutes to ruin it. If you think about that, you'll do things differently.”

Idea # 6:
Don’t Become a Patsy in the Game

Assume that a coin is fair

It has an equal probability of landing heads or tails when tossed

I toss it 99 times and get HEADS each time

For the next toss what is your prediction?

Will it land head or tail?

Assume that a coin is fair

It has an equal probability of landing heads or tails when tossed

I toss it 99 times and get HEADS each time

For the next toss what is your prediction?

Will it land head or tail?

What is the probability of getting 100 heads in 100 tosses in a FAIR coin

That’s simply 0.5^100

Or 1 in a 1,267,650,600,228,229,401,496,703,205,376 chance

What is the probability of getting 100 heads in 100 tosses in a FAIR coin

That’s simply 0.5^100

Or 1 in a 1,267,650,600,228,229,401,496,703,205,376 chance

That's 1 in 1 nonillion 267 octillion 650 septillion 600 sextillion 228 quintillion 229 quadrillion 401 trillion 496 billion 703 million 205 thousand 376

That comes to a somewhat low probability of 0.000000000000000000000000000078886090522101180541172856528278622967320643510902300477027893066406 25

What is more likely

This:

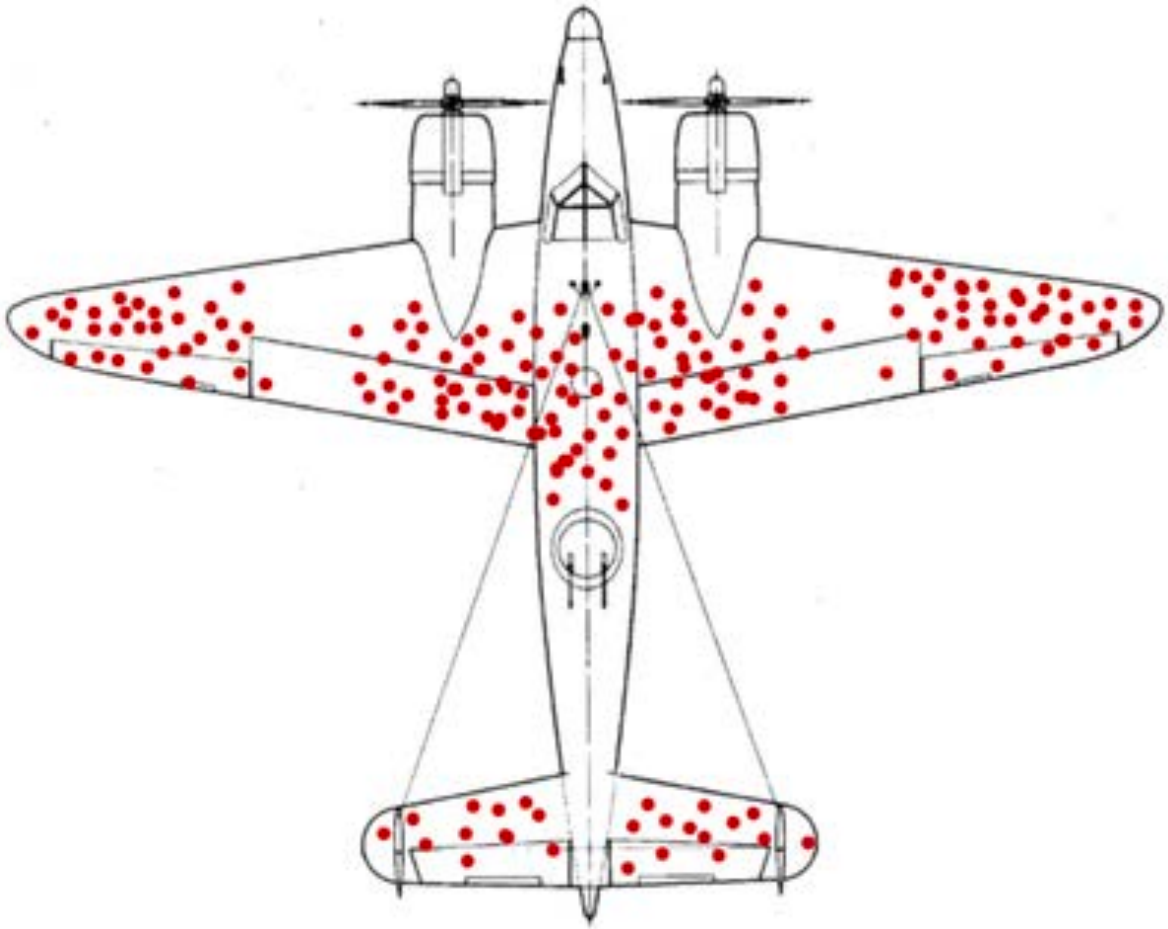
0.00000000000000000000000000078886090522101180541172856528278622967320643510902300477027893066406250

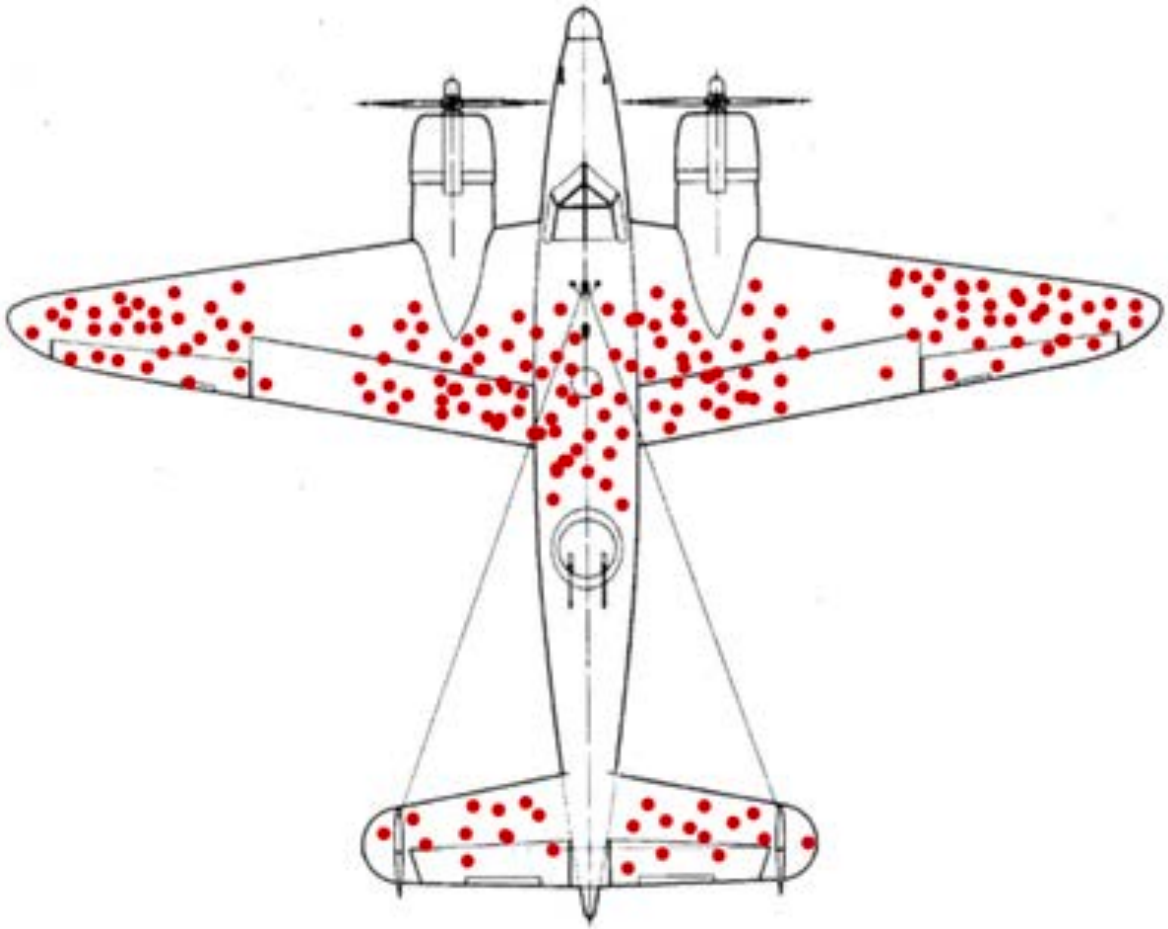
Or This?

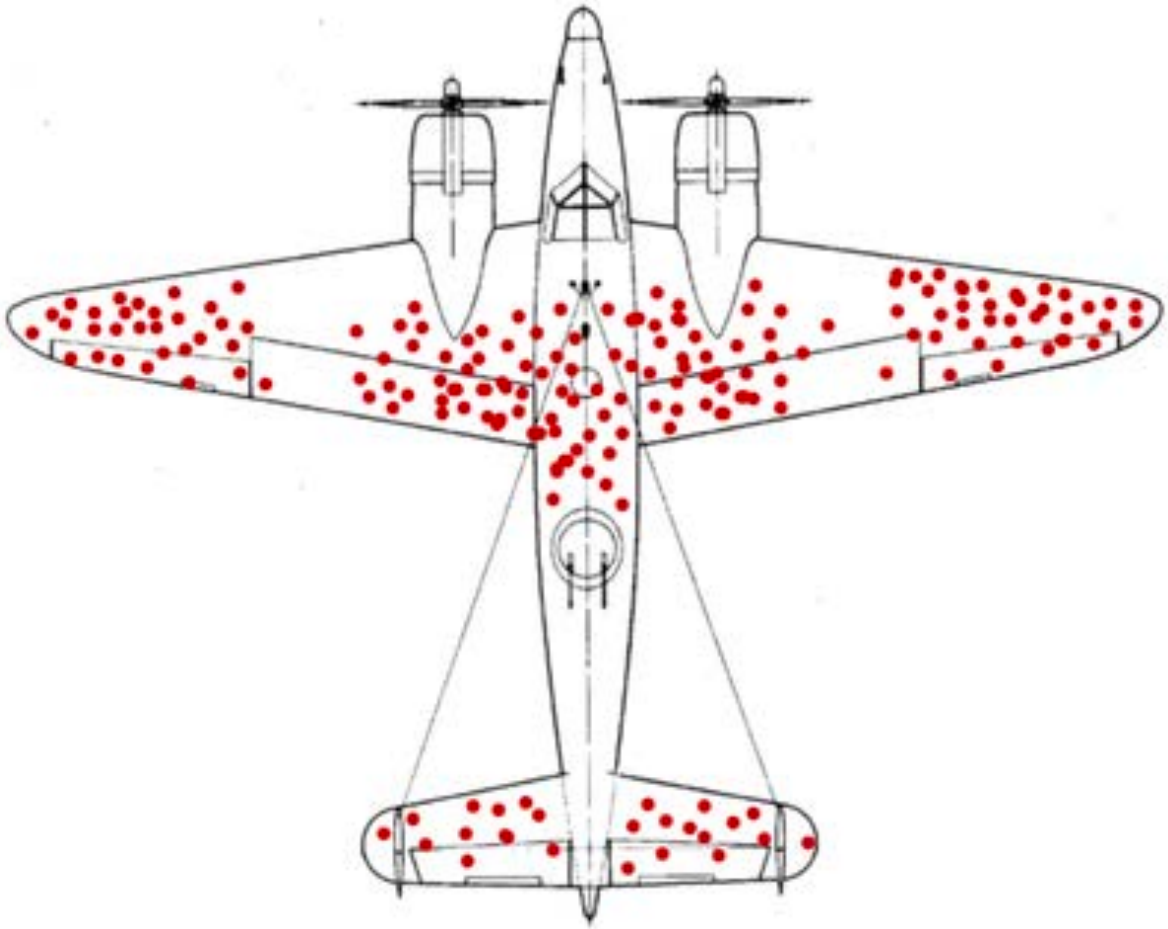
The Assumption that the coin is fair is FALSE!

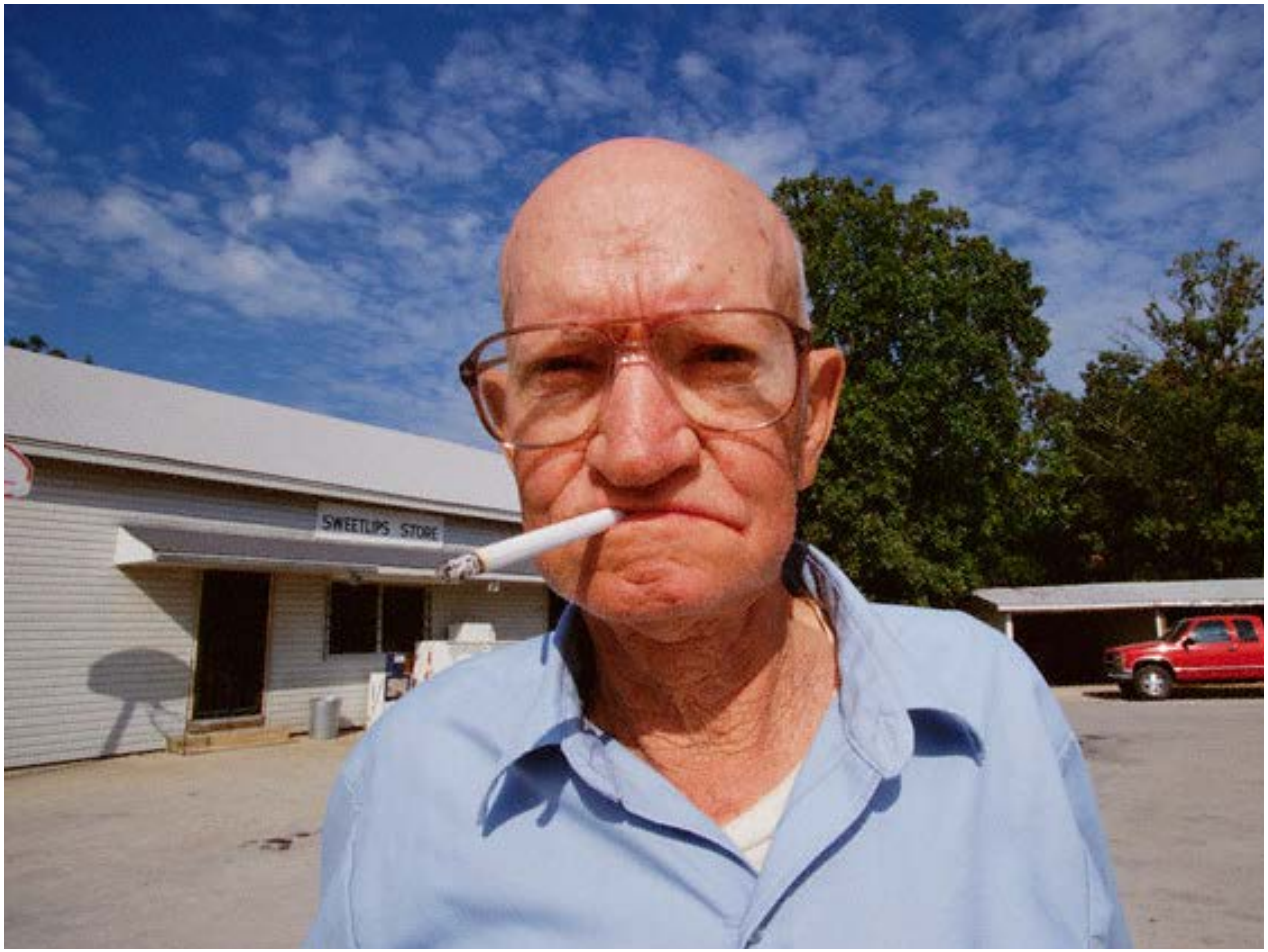
As they say in poker, “If you’ve been in the game 30 minutes and you don’t know who the patsy is, you’re the patsy.”

Idea # 7:
Think Like a Statistician

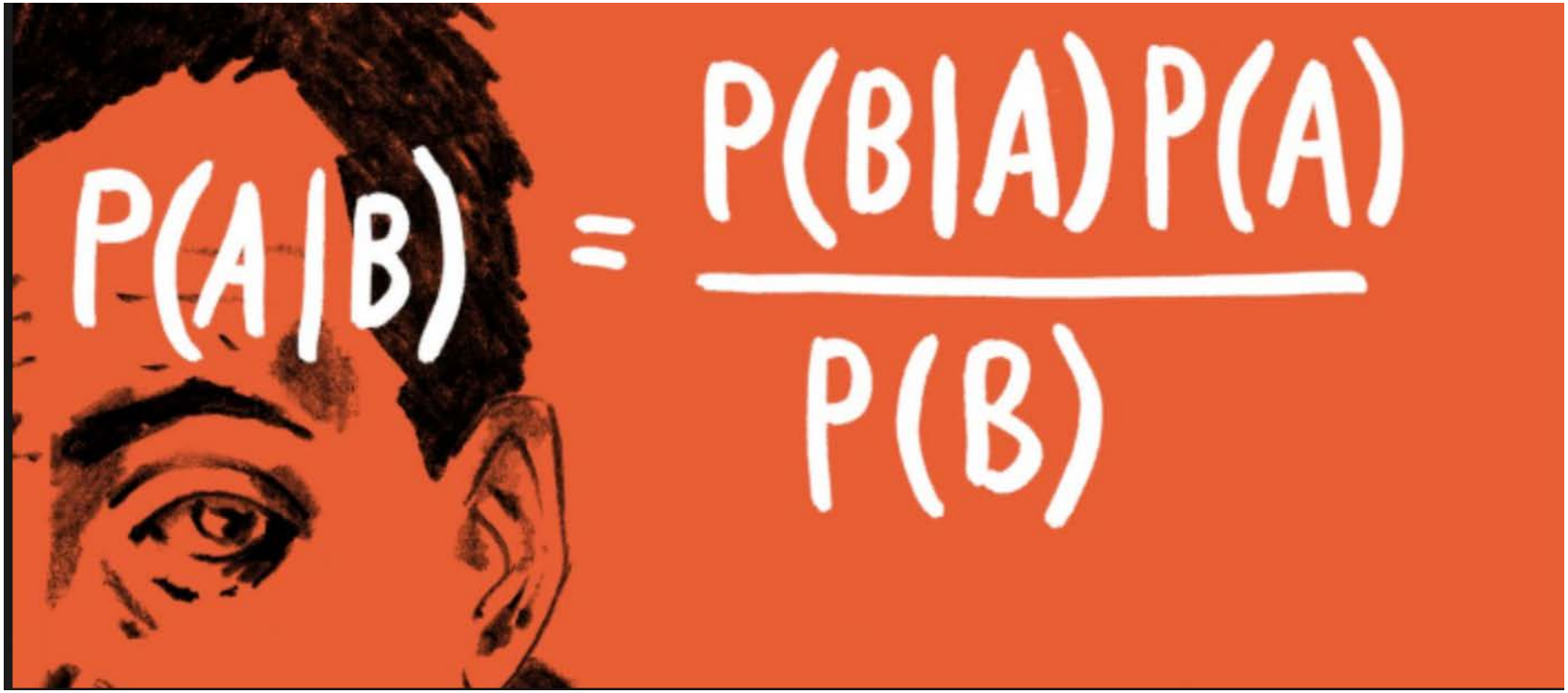







SWEETLIPS STORE

Idea # 8:
Think Like a Bayesian



Conditional Probability

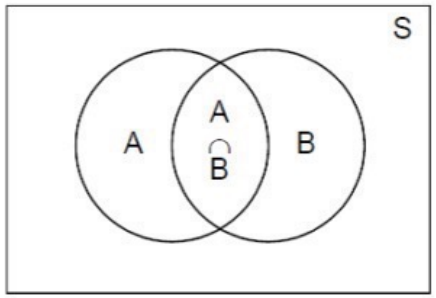
or

Bayes' Rule

CONDITIONAL PROBABILITY

The probability of occurrence of an event B when it is known that some event A has occurred is called a condition probability and is denoted by P(B/A). The symbol P(B/A) is usually read "the probability that B occurs given that A occurs" or "simply probability of B, given A".

Consider two events 'A' and 'B' of sample-space S. When it is known that event 'A' has occurred, it means that sample space would reduce to the sample points representing event A. Now for P(B/A) we must look for the sample points representing the simultaneous occurrence of A and B i.e. sample points in $A \cap B$.



$$\Rightarrow P(B/A) = \frac{n(A \cap B)}{n(A)} = \frac{\frac{n(A \cap B)}{n(S)}}{\frac{n(A)}{n(S)}} = \frac{P(A \cap B)}{P(A)}$$

Thus $P(B/A) = \frac{P(A \cap B)}{P(A)}$, where $0 < P(A) \leq 1$

Similarly, $P(A/B) = \frac{P(A \cap B)}{P(B)}, 0 < P(B) \leq 1$

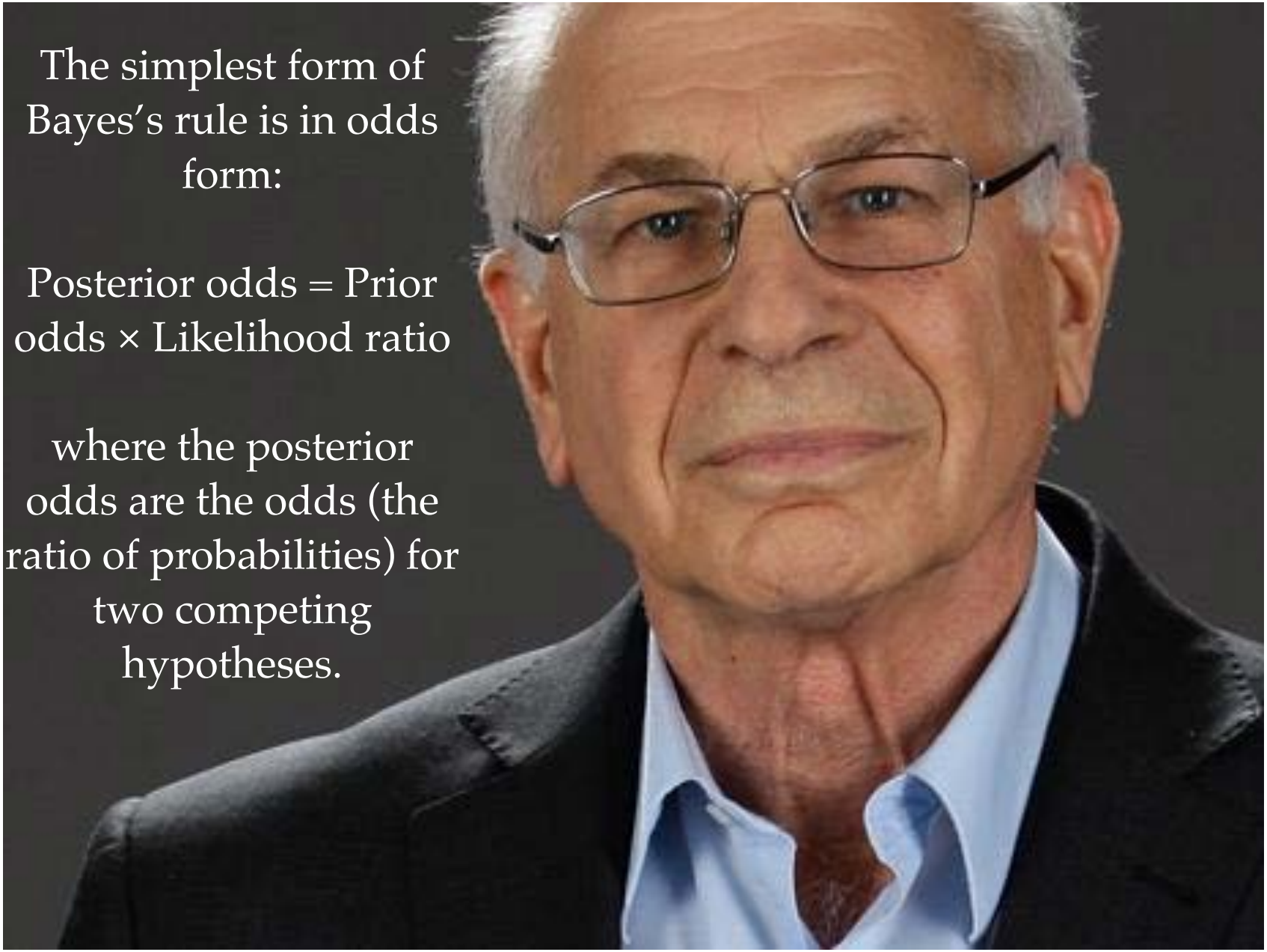
Hence, $P(A \cap B) = \begin{cases} P(A) \cdot P(B/A), & P(A) > 0 \\ P(B) \cdot P(A/B), & P(B) > 0 \end{cases}$

Consider the event 'B' of getting a '4' when a fair die is tossed. Now suppose that it is known that toss of die resulted in a number greater than 3 (say event A). And we have to obtain P(B/A)

i.e. the probability of getting a '4' given that a number greater than 3 has occurred. Clearly

$A = \{4, 5, 6\}, B = \{4\} \Rightarrow P(B/A) = \frac{1}{3}$

also $P(A \cap B) = \frac{1}{6}$ and $P(A) = \frac{3}{6} = \frac{1}{2} \Rightarrow P(B/A) = \frac{P(A \cap B)}{P(A)} = \frac{1/6}{1/2} = \frac{1}{3}$


The simplest form of Bayes's rule is in odds form:
Posterior odds = Prior odds × Likelihood ratio
where the posterior odds are the odds (the ratio of probabilities) for two competing hypotheses.

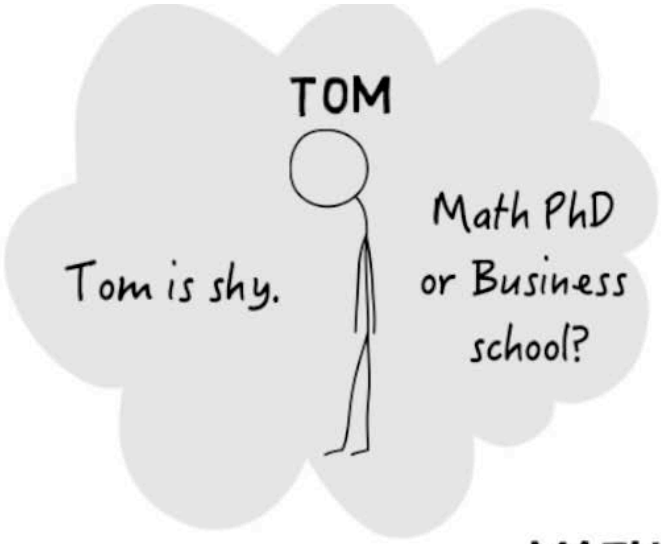
Posterior odds = Prior odds × Likelihood ratio

Base Rates (historical statistical information)

Information specific to the situation being examined

Imagine that you're walking across the campus of some large American University and you meet a guy called Tom. You chat with him for a few minutes and you notice the Tom is shy. He's not really making eye contact very often, he sounds as if he's mumbling.

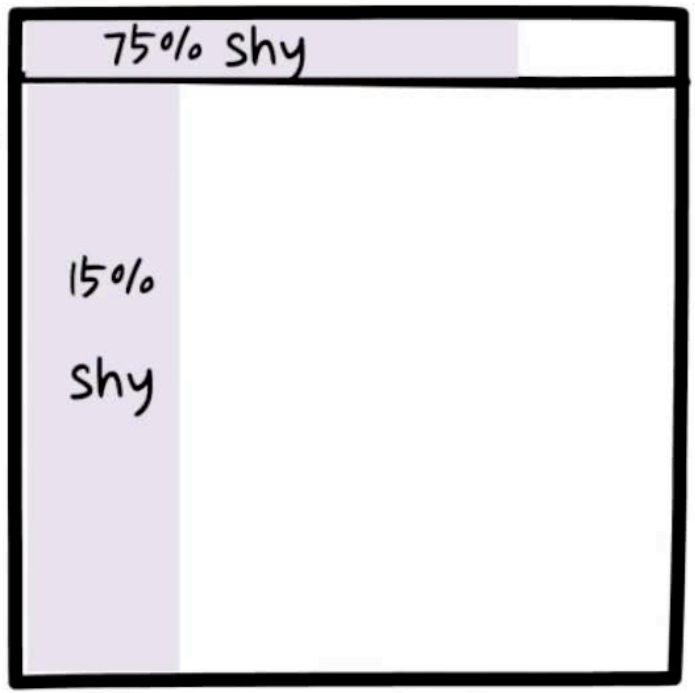
Is Tom more likely to be in a Math PhD program or in the business school? (Let's assume it has to be one or the other.)



MATH : BUSINESS

Prior odds ratio 1 : 10

Likelihood ratio 75 : 15



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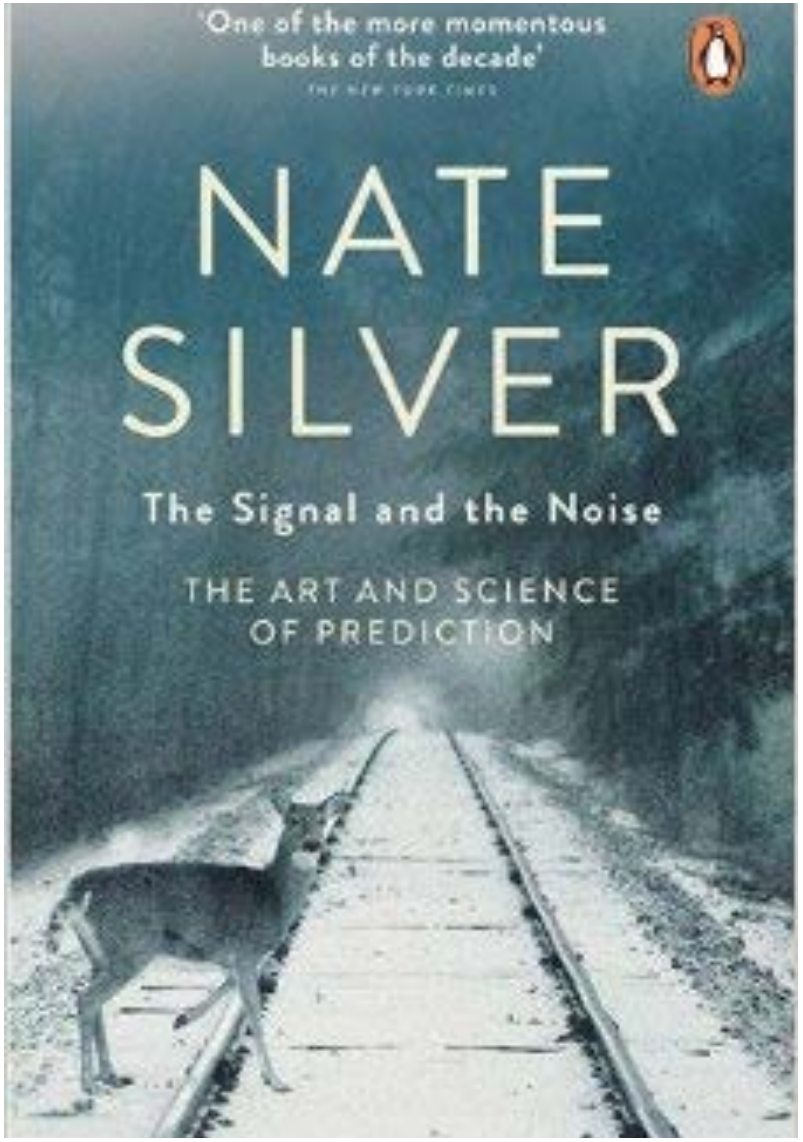

'One of the more momentous books of the decade'
NATE
SILVER
The Signal and the Noise
THE ART AND SCIENCE OF PREDICTION

FIGURE 8-5A: BAYES'S THEOREM—TERROR ATTACK EXAMPLE

PRIOR PROBABILITY		
Initial estimate of how likely it is that terrorists would crash planes into Manhattan skyscrapers.	x	0.005%
A NEW EVENT OCCURS: FIRST PLANE HITS WORLD TRADE CENTER		
Probability of plane hitting if terrorists are attacking Manhattan skyscrapers.	y	100%
Probability of plane hitting if terrorists are *not* attacking Manhattan skyscrapers (i.e. an accident).	z	0.008%
POSTERIOR PROBABILITY		
Revised estimate of probability of terror attack, given first plane hitting World Trade Center.	$\frac{xy}{xy + z(1-x)}$	38%

FIGURE 8-5A: BAYES'S THEOREM—TERROR ATTACK EXAMPLE

PRIOR PROBABILITY		
Initial estimate of how likely it is that terrorists would crash planes into Manhattan skyscrapers.	x	0.005%
A NEW EVENT OCCURS: FIRST PLANE HITS WORLD TRADE CENTER		
Probability of plane hitting if terrorists are attacking Manhattan skyscrapers.	y	100%
Probability of plane hitting if terrorists are *not* attacking Manhattan skyscrapers (i.e. an accident).	z	0.008%
POSTERIOR PROBABILITY		
Revised estimate of probability of terror attack, given first plane hitting World Trade Center.	$\frac{xy}{xy + z(1-x)}$	38%

FIGURE 8-5B: BAYES'S THEOREM—TERROR ATTACK EXAMPLE

PRIOR PROBABILITY		
Revised estimate of probability of terror attack, given first plane hitting World Trade Center.	x	38%
A NEW EVENT OCCURS: SECOND PLANE HITS WORLD TRADE CENTER		
Probability of plane hitting if terrorists are attacking Manhattan skyscrapers.	y	100%
Probability of plane hitting if terrorists are *not* attacking Manhattan skyscrapers (i.e. an accident).	z	0.008%
POSTERIOR PROBABILITY		
Revised estimate of probability of terror attack, given second plane hitting World Trade Center.	$\frac{xy}{xy + z(1-x)}$	99.99%

FIGURE 8-5B: BAYES'S THEOREM—TERROR ATTACK EXAMPLE

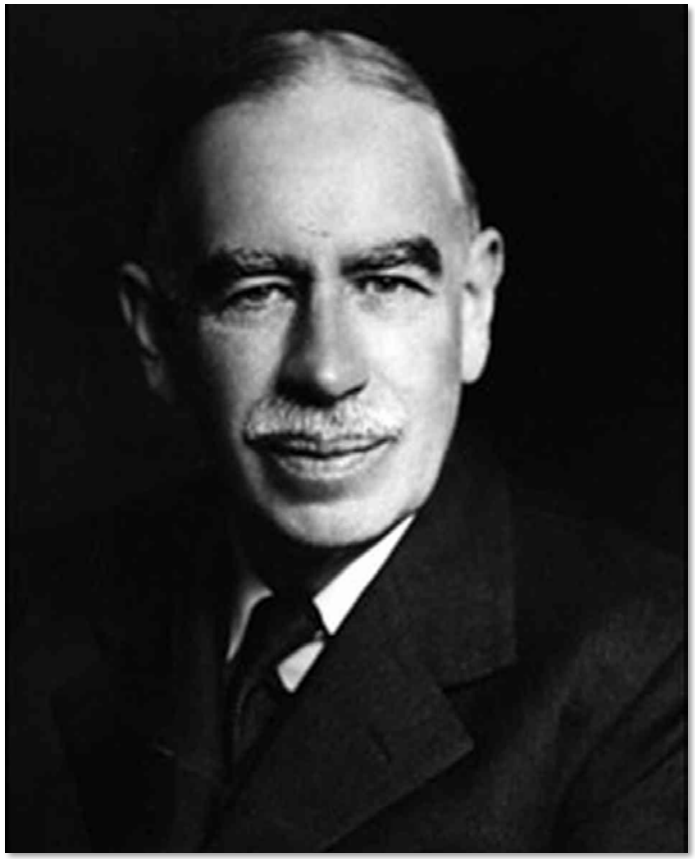
PRIOR PROBABILITY		
Revised estimate of probability of terror attack, given first plane hitting World Trade Center.	x	38%
A NEW EVENT OCCURS: SECOND PLANE HITS WORLD TRADE CENTER		
Probability of plane hitting if terrorists are attacking Manhattan skyscrapers.	y	100%
Probability of plane hitting if terrorists are *not* attacking Manhattan skyscrapers (i.e. an accident).	z	0.008%
POSTERIOR PROBABILITY		
Revised estimate of probability of terror attack, given second plane hitting World Trade Center.	$\frac{xy}{xy + z(1-x)}$	99.99%

Benefit # 1: Belief Updation

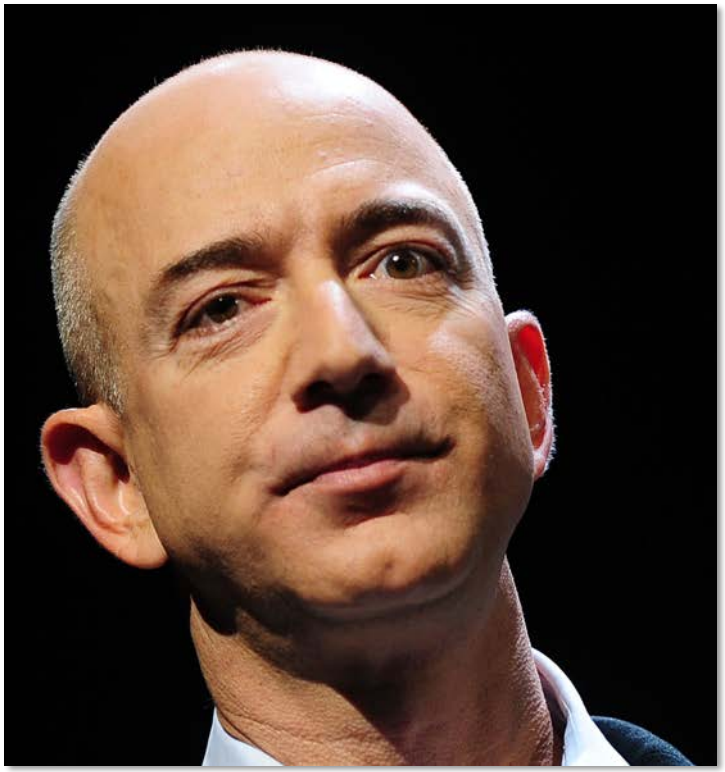
Belief updating is to good forecasting as brushing and flossing are to good dental hygiene. It can be boring, occasionally uncomfortable, but it pays off in the long term…


Confirmation Bias:
Overweighing evidence that confirms your prior notions and under weighing evidence that contradicts it

"What a man believes, he prefers to be true." - Sir Francis Bacon



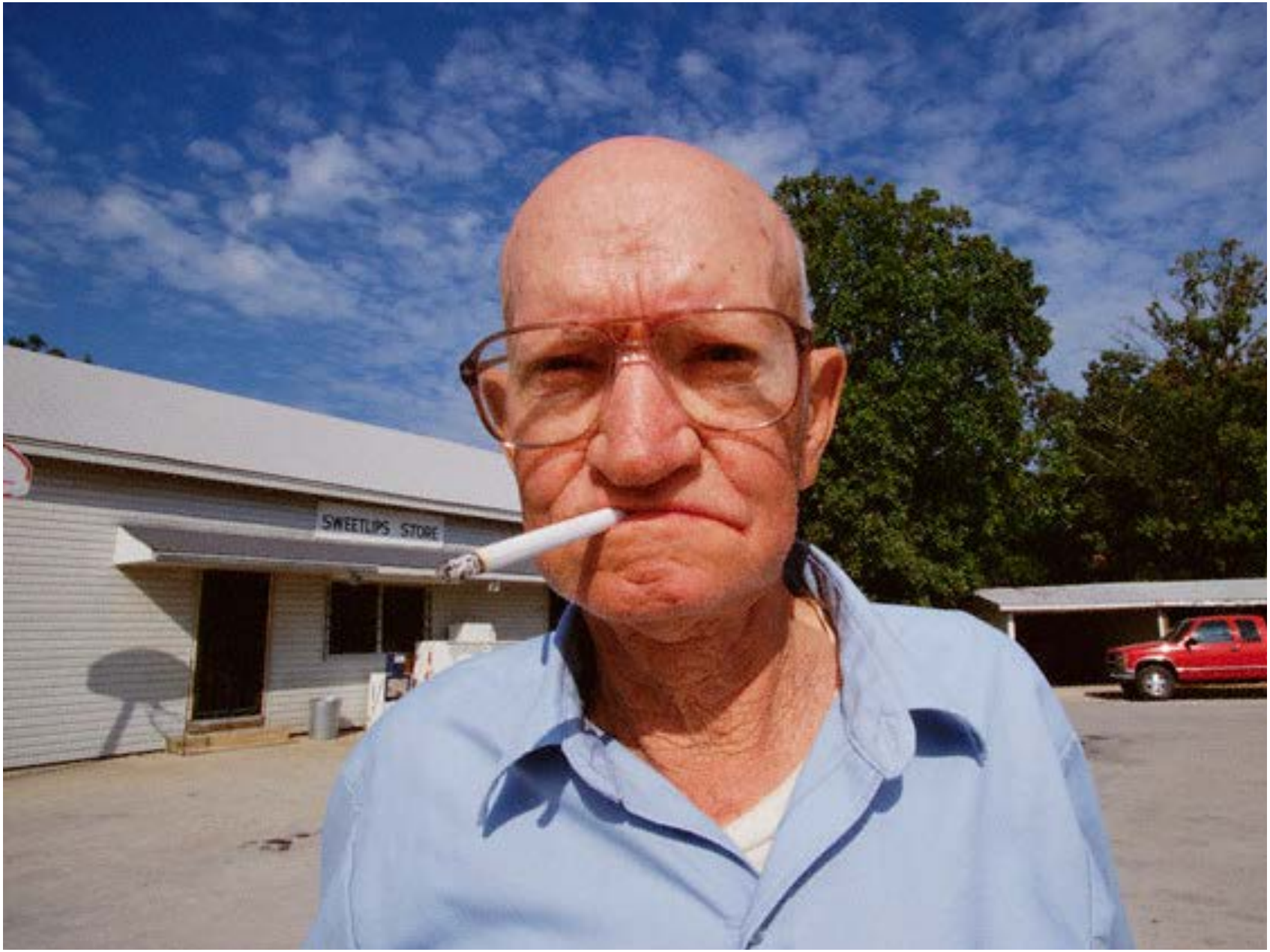
"When facts change, I change my mind. What do you do Sir?" - John Maynard Keynes



Jeff Bezos

People who were right a lot of the time were people who often changed their minds. He doesn't think consistency of thought is a particularly positive trait. It's perfectly healthy — encouraged, even — to have an idea tomorrow that contradicted your idea

Benefit # 2: Freedom from Insensitivity to Base Rates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Benefit # 3: Becoming More Objective

Summary

1. Compound Interest
2. Proof by Contradiction
3. Reductionism
4. Inversion
5. Small Probabilities, Large Consequences
6. Patsy in the Game
7. Think Like a Statistician
8. Think Like a Bayesian

 # 1:

Just how powerful some of the ideas that are taught in academia are, just how useful they are in making decisions and for understanding how the world really works;

2:
How becoming a wiser person over time requires application of these ideas;

3:
That these ideas will come from multiple disciplines and you will have to learn to be a broad thinker by picking up the best ideas from multiple disciplines;

4:
How you only need a handful of key ideas from key disciplines to really understand how the world really works; and

5:
How these ideas often combine to produce stunning outcomes

"Worldly wisdom is mostly very, very simple. And what I'm urging on you is not that hard to do if you have the will to plow through and do it. And the rewards are awesome – absolutely awesome." — Charlie Munger

Thank You