

# The Antifragile

The central theme of the book is “antifragility,” which Taleb defines in the Prologue:

“Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile. Let us call it antifragile. Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better.”

Another way to formulate it is: anything that has more upside than downside from random events shocks. An egg will not benefit from having a 5lb weight put on it, but your body can become stronger through similar stresses.

This builds on the arguments in Black Swan. When there's a Black Swan event, the Antifragile can thrive. But the fragile will frequently perish. Put another way, the Antifragile can benefit from positive black swans.

“Fragility implies more to lose than to gain, equals more downside than upside, equals unfavorable asymmetry.”

“Antifragility implies more to gain than to lose, equals more upside than downside, equals favorable asymmetry.”

## Damocles, Phoenix, Hydra

Taleb uses ancient examples to explain the triad of Fragile, Robust, and Antifragile. Damocles, who dines with a sword dangling over his head, is fragile. A small stress to the string holding the sword will kill him.

The Phoenix, which dies and is reborn from its ashes, is robust. It always returns to the same state when suffering a massive stressor.

But the Hydra demonstrates Antifragility. When one head is cut off, two grow back.

## Nature

Nature is a recurring demonstration of antifragility. When you lift weights, your body adapts to lift *heavier* weights next time. But for human systems, we tend to fight the last war, building a nuclear power plant that can withstand the worst earthquake *that we've seen*.

## The Streisand Effect & Criticism

This is also demonstrated in “The Streisand Effect,” where the desire to kill an idea can directly lead to its proliferation. Banned books are a good example, or the popularity of Ayn Rand despite her aggressive detractors. Or try to *not* think of a white elephant and see what happens.

## Fragile & Antifragile Jobs

Taleb also shows the dichotomy between certain lines of work and their fragility. As an author, for example, nothing he can do that generates attention will *reduce* the sale of his books.

However, if you're a midlevel executive employee at some bank, if you punch out an annoying drunk in a bar you will likely get fired, get an arrest record, and be unhirable. You're extremely fragile.

And then again at the lower end of the spectrum, say as a taxi driver, you have more freedom again because you are not so dependent on your reputation.

He also provides a heuristic: People who don't seem to care how they dress or look are robust or antifragile. People who have to wear suits and ties and worry about a bad reputation are fragile.

## Domain Dependence

Sometimes we understand something in one area, but fail to carry over the underlying logic into another domain. Many statisticians understand statistics, but still get tripped up by simple thought experiments. People will take an elevator to the gym to use the stairmaster.

While we understand the benefits of stress in medicine and health, we fail to carry it over to other parts of life. Small stresses on your income can be good for keeping you from accumulating silent risk or becoming cocky. Small fights in your relationship can help it become stronger, and avoid big fights.

## **The Procrustean Bed**

Taleb uses the “Procrustean Bed” story to demonstrate how we create harm by reducing variations. Procrustes would capture travelers and put them in his bed, stretching them on a rack if they were too short for it or chopping off their extremities if they were too tall. When we destroy variations to fit a model, we do similar harm.

## **The Turkey Problem**

A bigger theme in *The Black Swan*, but “the turkey problem” is how you can imagine a turkey raised and fed from birth, becoming more sure every day that it will continue to be well fed and taken care of, based on its past evidence, right up until Thanksgiving.

## **Buridan’s Donkey**

A donkey equally hungry and thirsty stuck between a bale of hay and water will die of starvation and thirst, unable to make a decision between the two. However, a random nudge in one direction will solve the problem for him. Randomness can help with decision making and becoming unstuck, but when we try to reduce it, we lose that beneficial stressor.

## **Stoicism**

Taleb invokes stoic principles on multiple occasions as ways of handling randomness and becoming more antifragile.

For example, success can make you fragile, because you now have much more to lose than you did before. You’re afraid of becoming poor. The stoic technique of “practicing poverty” helps reduce your fragility from being afraid of losing your wealth.

# Hormesis, Small Stressors & Inverse Hormesis

Hormesis is another example of Antifragility. By taking small doses of a poison, you can develop more immunity to it, just as vaccinations use a small dose of a disease to train your body to resist its stronger form.

We see similar antifragile benefits from fasting, weight lifting, running. And we also see that depriving systems of these beneficial stressors is harmful, as is evidenced by any person who has never been hungry or never exercised.

Aging, Taleb argues, is hastened by a lack of stress. We are living longer but people are more sick. All of our comfort has been detrimental to our healthspans. We thought aging causes bone degradation, but it seems that bone degradation causes aging.

## Competition

This can also be applied to competition. The best horses lose when they compete with slower ones, and win against stronger rivals. Absence of challenge can degrade the best of us.

## Distraction

Another example: static background noise makes it easier to pick up radio signals. Writing in cafés with background conversations helps you focus. We want a little stress, but not too much.

## Moods

Taleb also points out how many people are being put on antidepressants, and how mood swings are a natural part of the human condition. If someone is truly suicidal, sure, but the ability to wrestle with our dark side is part of life and great inspiration for creatives.

## Language

He also points out how real language learning is done “in the wild,” suffering embarrassment for not knowing things and struggling to be understood. It is not done through textbooks and

tests, as is evident by any child learning their first language(s).

## Problems with Modernity

Taleb points out numerous problems with modern life, mostly arising from removing the natural stressors that help us.

### Lions in the Zoo

Consider the life of a lion in a zoo and in the wild. The lion in the zoo might live longer, but is that really a desirable existence? Taleb points out that we used to have “free range humans,” before such things as suits and soccer moms and gym machines.

## Naive Intervention & Iatrogenics

There’s a mistaken desire to intervene, particularly from doctors, that can lead to “iatrogenics,” which means “harm caused by the healer.”

Harm from doctors accounts for more deaths than any single cancer.

There are two forms: the obvious iatrogenics, such as amputating the wrong leg, and the non-obvious iatrogenics, such as carelessly prescribing antidepressants and ADHD medication.

### The Agency Problem

Part of the issue comes from the agency problem where the agent (doctor) has different interests from the receiver of his services (the patient).

### Editing

Taleb shares a story of his article being aggressively edited for writing style by the Washington Post, so he pulled it and gave it to The Financial Times, who only made one edit, to correct a date. He points out that WaPo, in trying to over-edit, missed the only important error.

### Good Procrastination

Taleb points out that procrastination is not always bad, it is something deep within us that is able to identify the urgency of a problem. We don't procrastinate when a lion is attacking, but procrastinating responding to an email is probably fine.

Related, the cure to procrastination on the job is not to force yourself to create systems that fix it, rather, to find an occupation where you do not have to fight your impulses and where you do not procrastinate.

## The Barbell & the Bimodal Strategy

The barbell demonstrates an “antifragile balance,” the idea of two extremes kept separate, with avoidance in the middle.

This represents playing it very safe in some areas (staying robust to negative black swans), and taking a lot of small risks in other areas (open to positive black swans), to take advantage of antifragility. While avoiding being “in the middle.”

If you put 90% of your net worth in cash or T bills, and you use the other 10% for extremely aggressive and risky investments, you can never lose more than 10% of your net worth, but you're exposed to massive upside.

Or, you can take a very safe day job while you work on your literature. You balance the extreme randomness and riskiness of a writing career with a safe job.

Or, you do a serial barbell, where you have pure action then pure reflection (Seneca, Montaigne).

More examples: “Do crazy things (break furniture once in a while), like the Greeks during the later stages of a drinking symposium, and stay “rational” in larger decisions. Trashy gossip magazines and classics or sophisticated works; never middlebrow stuff. Talk to either undergraduate students, cab drivers, and gardeners or the highest caliber scholars; never to middling-but-career-conscious academics. If you dislike someone, leave him alone or eliminate him; don't attack him verbally.”

## Optionality

Taleb discusses optionality, freedom of choice, as a means of robustness and antifragility. Simply, the more options you have, the more freedom you have to respond to unforeseen circumstances, and the less fragile you are to sudden events. Financial independence is a big form of it, but there are others.

Certain fields do not have negative forms, there's no opposite of someone buying your book, so authors have more options because they have less downside.

## **Tinkering**

Taleb is a big proponent of trial and error, which he calls tinkering, as a way to figure things out and expose yourself to large potential upsides.

Many great inventions were toys, first. The steam engine was invented by the greeks for amusement, and it took a long time for us to realize it had practical applications.

## **The Teleological Fallacy**

The error that you know where you are going, and that you knew exactly where you were going in the past, and that others have succeeded in the past by knowing where they were going.

One form of this is “teaching birds how to fly,” where Taleb points out that a Harvard ornithological department could explain the mathematics of flight and how birds wings work, but the birds do not need to understand that in order to fly.

Taleb also argues against the “master pupil” relationships, arguing that those relationships developed because the people were like minded, not that they became like minded because of the relationship. **A personal note on this:** I've come to believe more and more that the right book and idea is not about completely teaching you something new, rather, helping you fully articulate something you have already begun to think about.

## **The Green Lumber Fallacy**

Taleb tells the story of someone who traded green lumber and made a considerable profit from it, while thinking that green lumber was literally logs painted green, not knowing it was

fresh wood. But not knowing this fact did not affect his ability to trade it effectively. So when we assume some information is necessary and important when it really isn't, we're committing the green lumber fallacy.

As another formulation, you do not need to understand aerodynamics or physics to ride a bicycle.

### **Some Rules for Optionality**

1. Look for optionality and rank things according to their optionality
2. Look for things with open ended, not closed ended, payoffs
3. Do not invest in business plans but in people, people who could change careers six or seven times
4. Make sure you are barbelled, whatever that means in your business

## **Nonlinearity**

“For the fragile, the cumulative effect of small shocks is smaller than the single effect of an equivalent single large shock.”

“For the antifragile, shocks bring more benefits (or less harm) as their intensity increases, up to a point.” Ex: lifting a 100lb weight once is more beneficial than lifting a 1lb weight 100 times.

Your flight never gets in 4 hours early, but you can certainly arrive 4 hours late. Anything unexpected, any shocks, is much more likely to extend the total flying time, ergo flight schedules are fragile.

Another example: Don't cross a river if it is “on average 4 feet deep.”

## **Via Negativa (by removal)**

Taleb argues that the solution to many problems in life is by removing things, not adding things.

### **Decision Making**



If you have more than one reason to do something, don't do it. By invoking more than one reason to do something, you are trying to convince yourself to do it. Obvious decisions (robust to errors) require no more than one good reason.

## The Lindy Effect

For the perishable (food, humans), every additional day in its life means it is closer to dying. For the nonperishable (books, ideas), every additional day of its life can imply a longer life expectancy. If a book has been in print for 100 years, it will likely continue to be read for another 100. But a person who has been alive for 100 years...

## Neomania

There is a class of things, typically technology, where we're obsessed by having the newest version of it. But for classical art, literature, works that have endured, older tends to be better. You likely replace your phone every 2 years, but not the painting on your wall.

## Medicine

There's no good evidence for the benefits of reducing swelling, but we automatically do it as part of the reflex to *do something*.

There are also cases where we get some small immediate benefits, and ignore the unknown larger side effects down the line. This would include drugs like Thalidomide, and nutritional interventions like Trans Fat. When we find something that seems to have a "free lunch," like steroids or trans fat, something that helps the healthy without a clear downside, it is likely there will be a concealed trap somewhere. It's a "sucker's bet."

Some more real and potential examples: Vioxx, and anti-inflammatory medicine that ends up causing heart issues; Bariatric surgery for overweight people (in place of dieting); Anti-depressants in non-suicidal cases; Cortisone; Disinfectants and other cleaning products; Hormone replacement therapy; Hysterectomies; Cesarean births when the mother won't otherwise die; Whitening of rice, wheat; Sunscreen; Excessive hygiene; Not eating dirt; High fructose corn syrup; Soy milk; Child psychiatry.

He specifies though that iatrogenics is only a concern when someone is not terminal. IF they are at risk of death, iatrogenics don't matter, it's the little unnecessary interventions that are problematic.

He also specifies that what mother nature does and has done is rigorous until proven otherwise, but what humans do is flawed until proven otherwise. Nature's fat's turn out to be very healthy, human designed ones, not so much.

Treating the *tumor that will not kill you* shortens your life since chemotherapy is toxic.

## Diet

Drink no liquid that isn't at least a thousand years old (wine, water, coffee). Eat nothing invented or re-engineered by humans.

When consuming plants they would have been regular, meat irregular, so it would make sense to eat mostly plant based most of the time then feast on meat intermittently.

In nature, we had to expend energy to eat. Lions do not eat then hunt for fun. Fasting is quite good for us, and natural. We do not need to load up on food before doing something, rather, re-feed after.

## Other removals

"I would add that, in my own experience, a considerable jump in my personal health has been achieved by removing offensive irritants: the morning newspapers (the mere mention of the names of the fragilista journalists Thomas Friedman or Paul Krugman can lead to explosive bouts of unrequited anger on my part), the boss, the daily commute, air-conditioning (though not heating), television, emails from documentary filmmakers, economic forecasts, news about the stock market, gym "strength training" machines, and many more."

## Wealth

He also points out the ill health and early death of many rich people, and argues: "If true wealth consists in worriless sleeping, clear conscience, reciprocal gratitude, absence of envy, good appetite, muscle strength, physical energy, frequent laughs, no meals alone, no gym

class, some physical labor (or hobby), good bowel movements, no meeting rooms, and periodic surprises, then it is largely subtractive (elimination of iatrogenics).”

# The Ethics of Fragility and Antifragility

Two rules for skin in the game:

1. Never get on a plane if the pilot is not on board
2. Make sure there is also a copilot

Another rule: “Never ask anyone for their opinion, forecast, or recommendation. Just ask them what they have, or don’t have, in their portfolio.”

Watch what people do, not what they say. Many researchers on happiness are earning more than \$70,000 a year despite their own research saying it won’t make them any happier.

Only large corporations can afford to sell you things that kill you. Small ones go bust too easily, so there is a risk from taking advice and products that could not survive on small scales.

Something being marketed is necessarily inferior, otherwise it would not need to be aggressively marketed. Marketing beyond conveying information is insecurity.

The pursuit of meaning within Big Data has brought about many more spurious and random relationships than meaningful understanding. The false relationships will grow much faster than the real one, simply because chance allows so many more of them to be found.

## Quotations

“Wind extinguishes a candle and energizes fire.”

“If you see a fraud and do not say fraud, you are a fraud.”

“A man is morally free when... he judges the world, and judges other men, with uncompromising sincerity.” – George Santayana

“If humans fight the last war, nature fights the next one.”

“Ancestral life had no homework, no boss, no civil servants, no academic grades, no conversation with the dean, no consultant with an MBA, no table of procedure, no application form, no trip to New Jersey, no grammatical stickler, no conversation with someone boring you: all life was random stimuli and nothing, good or bad, ever felt like work. Dangerous, yes, but boring, never.”

“This is the central illusion in life: that randomness is risky, that it is a bad thing— and that eliminating randomness is done by eliminating randomness.”

“Convincing— and confident— disciplines, say, physics, tend to use little statistical backup, while political science and economics, which have never produced anything of note, are full of elaborate statistics and statistical “evidence” (and you know that once you remove the smoke, the evidence is not evidence). The situation in science is similar to detective novels in which the person with the largest number of alibis turns out to be the guilty one.”

“I derived the rule that what is called “healthy” is generally unhealthy, just as “social” networks are antisocial, and the “knowledge”-based economy is typically ignorant.”

“The best way to verify that you are alive is by checking if you like variations. Remember that food would not have a taste if it were not for hunger; results are meaningless without effort, joy without sadness, convictions without uncertainty, and an ethical life isn’t so when stripped of personal risks.”