

CRITICAL THINKING HANDBOOK

**Bite-Sized Learning For Analytical
Mind**

ELEVATE YOUR THINKING GAME WITH CONCISE LEARNING

NIMISH GARG

A Big Thanks to All!

This book is a testament to the power of collective learning and critical thinking. It is dedicated to everyone who is passionate about asking questions and embracing a positive mindset for continuous growth.

I extend my heartfelt gratitude to:

- My Father, who always encourages me to explore new horizons.
- Kalvium for invaluable insights into the world of critical thinking.
- You, the Readers as your thoughts create a vibrant community.
- To sources for sharing remarkable content online, contributing to the betterment of society.

This book is a collaborative journey of ideas, and I'm thankful to everyone who values the art of critical thinking. Let's embark on this exploration and learning journey together!

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Foreword

Discover the power of critical thinking in this handbook designed for analytical minds. Elevate your thinking game with bite-sized learning that promises a practical approach to enhance your cognitive skills.

NIMISH GARG

THE TWO SYSTEMS OF THINKING

Chapter 1

Why think Critically?

Introduction

In our day-to-day lives, we make multiple decisions – from choosing the color of a product we are purchasing, to deciding what to have for dinner, picking an outfit to wear, or battling with the urge to stop scrolling mindlessly and do something productive instead.

More or less, what happens is – we mostly answer questions with intuition without fully reasoning things out. The human mind is subject to making thinking errors, which cause us to make the wrong decisions in life.

So before asking why one should think critically, we should first understand what critical thinking actually is.

What is Critical Thinking?

Critical Thinking is the ability to analyze information skillfully and objectively, arriving at a reasoned judgment. It's considered one of the most crucial human skills for the future, effective critical thinkers excel at making the right decisions – regardless of the situation.

Many of us often make suboptimal decisions, whether consciously or subconsciously. It's essential to acknowledge that the human brain undergoes a complex and energy-intensive process during thinking, designed to expend the least amount of energy possible.

Quick Exercise #1

These are courtesy of Daniel Kahneman from his book "Thinking Fast and Slow". Answer the questions with the first answer that pops into your mind.

Question 1: Consider the letter K. Is K more likely to appear as the first letter in a word or as the third letter?

Question 2: Politicians are more likely to be involved in extra-marital affairs than doctors or lawyers. True or false?

Question 3: "Nimish from India is very shy and withdrawn, invariably helpful but with very little interest in people or in the real world of reality. A meek and tidy soul, he needs order and structure, and a passion for detail." Is Nimish more likely to be a librarian or a farmer?

Did you answer them as Follows?

Answer 1: The first letter

Answer 2: True

Answer 3: Librarian

If yes, then here are some facts to consider.

Fact 1: It's easier to think up words starting with the letter K than words having K as the third letter, when in fact it appears more in the third position.

Fact 2: Extra-marital affairs of politicians are more likely to be reported in the media and media coverage often distorts perceptions. Thus, we remember instances of politicians more often than those of people in other professions. This doesn't mean that politicians are statistically more likely to have affairs.

Fact 3: There are almost 150 million farmers in India (10% of India's population). There is no way there are those many librarians who exist in our country. While the description of Nimish fits the typical description of a librarian, he is statistically more likely to be a farmer in India.

So, what you did wrong?

If you got the answers to the questions wrong, don't worry! Most people get these wrong, that's because we answer such questions with intuition without fully reasoning things out. Our human mind is subject to many such Thinking errors, which cause us to make the wrong decisions in life.

Essential Points for Critical Thinking

- **Skepticism** = Doubting the truth of things.
- **Objectivity** = Seeing something from a neutral point of view.
- **Reasoning** = Explaining why we believe something to be true.
- **Open-Mindedness** = Changing our minds when facts change.

Essential Principles for Everyday Thinking

1. Asking the right questions to assess claims and arguments.
2. Building skills to assess evidence and adapt thinking.
3. Considering all angles before making judgments.
4. Identifying key points, analyzing information (sources), and weighing evidence.
5. Forming your own independent viewpoint.
6. Not just finding flaws but being Creative, Reflective, and Adaptive.
7. Gaining confidence to hold your opinions.
8. Sense of discovery and excitement in learning.
9. Becoming a clearer, better thinker through practice.

Understanding Stereotypes

Before we explore whether stereotypes can ever be beneficial, let's take a moment to understand what stereotypes are.

Stereotypes are preconceived notions or beliefs about a particular group of people. They often arise from simplified and generalized assumptions, impacting our perceptions and judgments.

Can Stereotypes ever be Good?

1. Survey and Stereotypes:

- In 2007 researchers surveyed 180 teachers to understand the stereotypical mindset of teachers towards the students. Negative stereotypes emerged labeling:

- Black students as aggressive,
- White students as selfish, and
- Asian students as shy.

- The "model minority" stereotype portrays Asians as industrious, intelligent, and gentle, but this seemingly positive stereotype can be harmful.

2. Model Minority Stereotype Origins:

- The "model minority" stereotype emerged in the mid-20th century to describe Chinese Americans and later extended to other Asian populations in the US.

- After World War II, Japanese Americans were portrayed as compliant, diligent, and respectful of authority to counter anti-Asian sentiment.

How to navigate Stereotypes:

Avoid falling into stereotypical thinking by applying Skepticism, Objectivity, Reason, and Open-Mindedness - the four pillars of Critical Thinking. In the upcoming modules, we delve deeper into strategies for avoiding stereotypes.

Now that you have gained insights into stereotypes and learned how to avoid them. Let's shift gears and challenge your grammar and math skills.

Quick Exercise #2

Question: Which of the following statements is correct? Answer quickly.

- **Statement A:** The yolk of the egg is white.
- **Statement B:** The yolk of the egg are white.

So, what happened?

You might have quickly chosen A or B based on your grammar rules but whichever you did - you missed the twist: neither A nor B is correct. Egg yolks are never white - they are yellow in color!

In this question, it was easy for our brain to choose between one of the two given choices (lesser energy consumed) as compared to evaluating if it was a trick question!

Quick Exercise #3

Question: Solve all these as quickly as possible -

1. 2×4
2. 10×20
3. 13×2
4. 33×48

So, what happened?

When you hit 33×48 , did you slow down and take a pen & paper or calculated it in your phone's calculator? But I am pretty sure that most of you didn't even try doing the calculations and just skipped the problem.

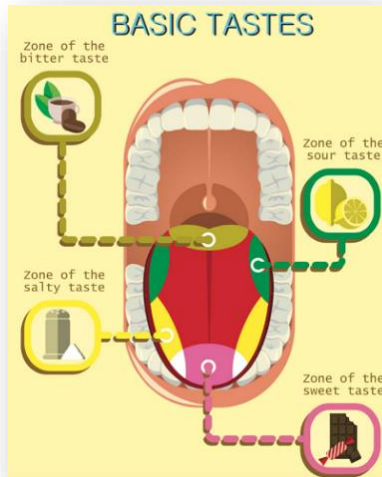
Anyways, that process would have consumed a lot of your brain's resources. This is why most of us hate Math as a child or even as a grown-up!

Critical Thinking is all about understanding this flaw of your brain and training your mind for more accurate decision-making.

Quick Exercise #4

Answer the question quickly without googling:

Question: The tongue has 4 different zones to measure the four basic tastes - bitterness, sourness, saltiness, and sweetness. True or false?



[Image Credits: LaKirr/Shutterstock.com]

Answer: A lot of science textbooks would say "True", this information is false.

Some facts about your Brain

- The Brain consumes a staggering 20% of the body's energy while at rest. It never completely shuts off, maintaining continuous communication between neurons, and sustaining a consistent energy demand regardless of task complexity.
- Hearing demands fast and precise signaling, while smell relies on a slow process.
- The brain lacks energy reserves and relies on a constant supply of oxygen and energy to function properly.

"You change the world by being yourself."

- Yoko Ono

Common MythConceptions

World's most contagious falsehoods



BODY FOOD HISTORY LAW MIND NATURE RELIGION SCIENCE SPORT



The Vomitorium

Not a room Romans used for Bacchanalian binges, but the name for the entrance to a stadium.



Different tongue parts

There are no different sections for each taste: bitter, sour, salty, sweet & umami (savory/meaty).



Electric fan @ night

Big myth in South Korea that this is deadly. Very unlikely to harm you. Unless you put the fan in the bed.



Sharks = no cancer

Oh yes they do get cancer. Particularly skin cancer.



Black holes

Not really 'holes' but hugely dense objects with massive gravitational pull.



Wake sleepwalkers?

They'll be really confused, but it's okay. They're more likely to hurt themselves if they're not awoken.



Napoleon was short

A tall tale. At 5'7", he was actually above average height for a Frenchman of the time.



Bulls hate red

Bulls are colour-blind. They actually react to motions of the bull fighter's cloth as a perceived threat.



Great Wall of China

Not visible from space. Myth. Now stop saying it!



Missing persons reports

Police don't demand a 24-hour period before accepting a missing persons report.



Bananas grow on trees

Actually grow on massive herbs that resemble trees. Bet you didn't know that.



Oil stops stuck pasta

Nope. But it can stop the water foaming or boiling over.



Dogs sweat by salivating

No. They regulate temperature through panting. They actually sweat through footpads.



Body heat & the head

Only in infants is most heat lost through the head. Or if the head is the only uncovered part of the body.



Vikings' horned helmets

Actually created by a costume designer for a 19th-century Wagner opera.



Bats are blind

Don't be fact-blind! Bats can not only see. They can also use echolocation. That's why they're so awesome!



Salieri hated Mozart

Nothing like the film. They were composer friends with a little rivalry. Nothing more.



Iron maidens

Never were medieval torture devices, but 18th-century fakes created for sensational circuses.



Don't touch baby birds!

Birds have a limited sense of smell so won't abandon babies who 'smell' of humans.



Don't eat & swim!

Doesn't increase risk of cramps; alcohol is the biggest risk increaser. But a full stomach will make you short of breath.



Einstein failed maths

Nope. He failed an entrance exam for a school but still excelled in maths.



We have 5 senses

We actually have close to 20, including balance, pain, movement, hunger, thirst, etc.



"Yes, I'm a cop"

US undercover police do not have to identify themselves as cops. A Hollywood-induced myth.



MSG = headaches

No proof, just anecdotal evidence implicating flavour 'enhancer' monosodium glutamate.

 <p>Goldfish 3-sec memory While not the smartest, goldfish boast a memory span of 3 months - better than most politicians.</p>	 <p>Humans & dinosaurs Despite 41% of US adults thinking they coexisted, we actually missed each other by ~63 million years.</p>	 <p>Evolution is a 'theory' In science, a 'theory' is anything more than a conjecture. Usually an extensively tested idea uniting data from many observations.</p>	 <p>Chastity belts Not anti-adultery devices. Instead invented by prudes in the 19th century to prevent 'dangerous' masturbation.</p>
 <p>We evolved from chimps No. Along with bonobos, they are our closest living genetic relatives. A shared ancestor lived 5-8 million years ago.</p>	 <p>Glass is a liquid Actually an 'amorphous solid'. But that's why stained-glass windows are thicker at the bottom. Nope. It's just badly made glass.</p>	 <p>Caffeine dehydrates you Not really. The diuretic effect of caffeine is offset by the amount of water in a caffeinated drink.</p>	 <p>Shaving thickens hair Regrown hair isn't thicker, coarser or darker, it just appears so because it's no longer tapered.</p>
 <p>Sugar = hyperactivity Studies have disproved this. ADHD and poor behaviours still occurs in children with sugar-free diets.</p>	 <p>Vaccines cause autism Groundless fears based on fraudulent research that's been shown to have been manipulated.</p>	 <p>Dropped pennies kill Terminal velocity of a penny is 30-50 mph, which isn't fast enough. It would hurt, though.</p>	 <p>Left & right brain No solid division between talents of each hemisphere; left brain can learn 'right brain' functions & vice-versa.</p>
 <p>The Three Wise Men Nowhere in the New Testament does it specify there were three.</p>	 <p>Alcohol keeps you warm Dilates warm blood vessels near the skin, creating the impression of warmth. It can drop core body temp.</p>	 <p>Fatwa = death sentence It actually means 'non-binding legal opinion'.</p>	 <p>Only 10% of brain Misunderstood metaphor. Proportion of our brain 'firing' is task-dependent. Ultimately, all cells are important.</p>
 <p>Satan rules Hell Doesn't actually say this anywhere in the Bible.</p>	 <p>Milk increases mucous Nope. It just straight doesn't. There's no need to avoid dairy if you have a cold.</p>	 <p>Salty water boils quicker Adding a sprinkle of salt to fresh water makes no difference. Huge, sea-level amounts do.</p>	 <p>Alcohol kills brain cells Only in heavy users & alcoholics who rely on alcohol to get most of their calories.</p>
 <p>Multiple personalities Schizophrenia technically means 'split-mind', but it is different to multi-personality disorder.</p>	 <p>Jihad is 'holy war' It actually translates as 'struggle'. Though it does come in 'lesser' & 'greater' flavours.</p>	 <p>No sex before the game! No evidence sex impairs athletic performance. Could even help athletes due to increased testosterone.</p>	 <p>Flushed water rotation Does not rotate the other way in the S. hemisphere. The Coriolis effect doesn't affect water in toilets.</p>
 <p>7 years to digest The chewy base of gum is indigestible & passes straight through. The remainder is absorbed.</p>	 <p>Washington & weed He grew hemp to make rope & clothes, but there's no evidence he smoked a phat one most nights.</p>	 <p>Black belts are masters Only introduced in 1880, in Judo, to show competence in basic techniques. Not ninja-level mastery.</p>	 <p>Martyrs & 72 virgins A matter of debate in Islam. Nowhere in the Qu'ran, but is reported in other texts.</p>

David McCandless // v1.1 // Sep 2014
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InformationIsBeautiful.net

sources: http://en.wikipedia.org/wiki/List_of_common_misconceptions
Snopes.com, NYTimes, StraightDope
data: bit.ly/KIB_Mythconception

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"Falsehood flies, and truth comes limping after."

- Jonathan Swift

Unraveling Fake News and Misleading Statistics

Understanding the Power and Pitfalls of Statistics:

In your decision-making journey, statistics play a significant role. Understanding them requires careful attention because there's more than what meets the eye.

Unveiling Simpson's Paradox:

Dive into the world of Simpson's Paradox to witness the paradoxical nature of data. Data may appear to contradict itself when grouped differently due to the lurking variables, making interpretation complex.

Hospital Survival Rates: A Deceptive Nature of Statistics:

Explore the choice of hospitals based on survival rates, and you'll encounter the deceptive nature of statistics. This can be misleading due to varying patient health conditions, illustrating Simpson's paradox.

Avoiding the Paradox:

While there's no universal solution to Simpson's Paradox, your careful analysis and consideration of lurking variables become paramount.

Data Caution in a Manipulative World:

Misleading statistics can be wielded as tools of manipulation against you. Hence, your vigilant evaluation of data becomes crucial in the age of information overload.

Complexities of Map

A Question to Ponder: Observe the World Map. Compare the size of Africa and Greenland. Can you state which one is larger or do they appear the same?



The Reality Unveiled:

Transforming a globe into a flat map involves a process called projection, where the surface of a sphere is represented on a plane. This process introduces distortions in shape, distance, direction, and land area. Various map projections serve different purposes, each with its set of trade-offs.

While there's no perfect projection, cartographers continually explore alternatives. While a globe provides the most accurate representation, the use of flat maps involves inevitable trade-offs.

Dispelling the "10% Brain Myth":

Contrary to the popular myth suggesting that humans only use 10% of their brains, the reality is quite different. Most neurons remain relatively silent, a strategy employed by the brain to conserve energy. It's a fascinating glimpse into the complexities of our brain's functioning.

Chapter 1 Exercise


Question 1: Reflect on at least 3 stereotypical beliefs that either you or people you have observed have held.

Question 2: Recall 3 things you believed to be true - but later discovered to be false since you didn't question them deeply enough the first time.

Write your Answers Here

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