QUESTIONS, BIASES & DATA: THREE ALTERNATIVE PILLARS OF LSS TO CONSIDER

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Lost In Translation

- What are you asking
- Why are you asking
- Knowing your audience
- Consider the question from the perspective of others
  - *Could the question be interpreted in more than one way*
- Consider the channel in which the questions is asked
  - *In person*
  - *Telephone*
  - *E-mail*
  - *Text*

When did you arrive?

My Story

Themes behind these three pillars

- Asking the right questions
  - *Story of ?????*
- Identifying and eliminating biases
  - *Common biases we can easily recognize in each other*
- What is the data not telling us and fake data vs real data
  - *Recognizing misleading information*

What are your expectations for tonight?

About Me

- Recently published author
- Jefferson Health & Thomas Jefferson University
- GlaxoSmithKline
- Cardinal Health
- Scholle Corporation
- Wesley-Jessen
- Purdue University
- Buffalo, NY

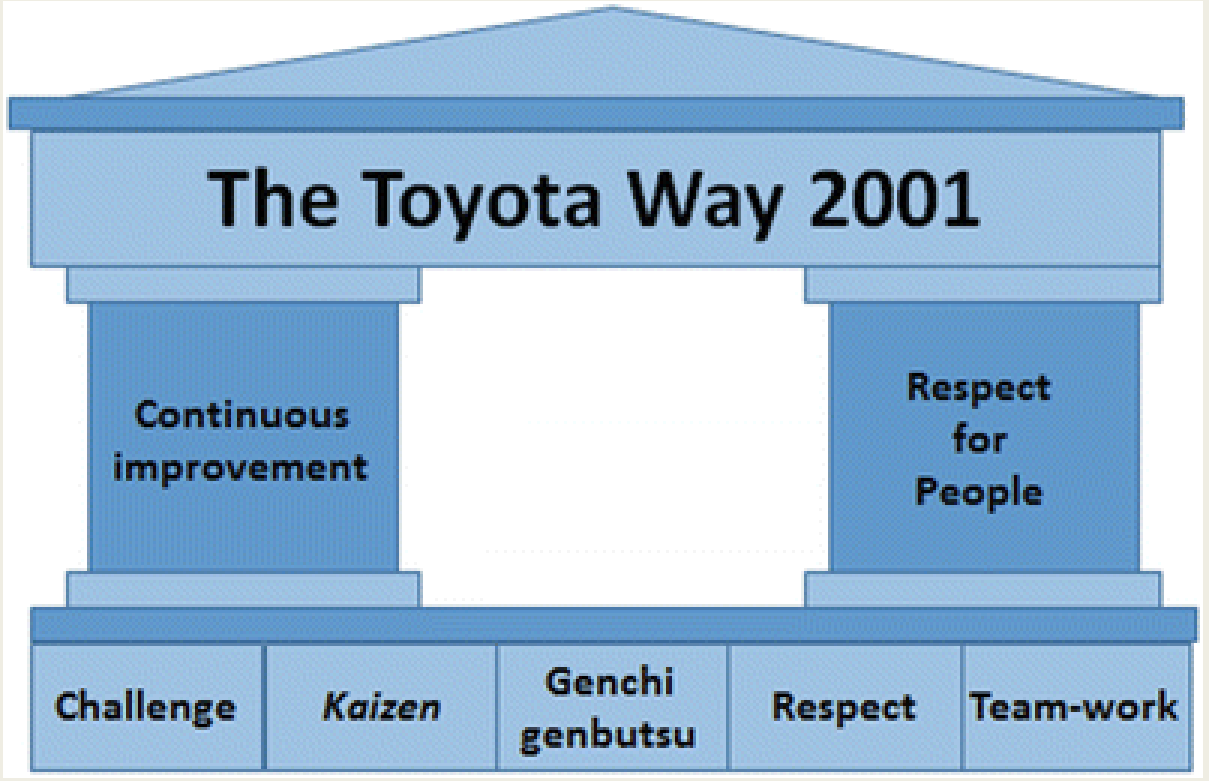
My Philosophy

- It’s not all about manufacturing
- Creating the best processes without “Leadership” will fail
- We are all Leaders
- Focus on the customer (internal & external)
- Know the language of your customer
- Seek examples from outside your industry
- You win or you learn
- I am not an expert or source of any truth

Traditional Pillars of Lean Six Sigma

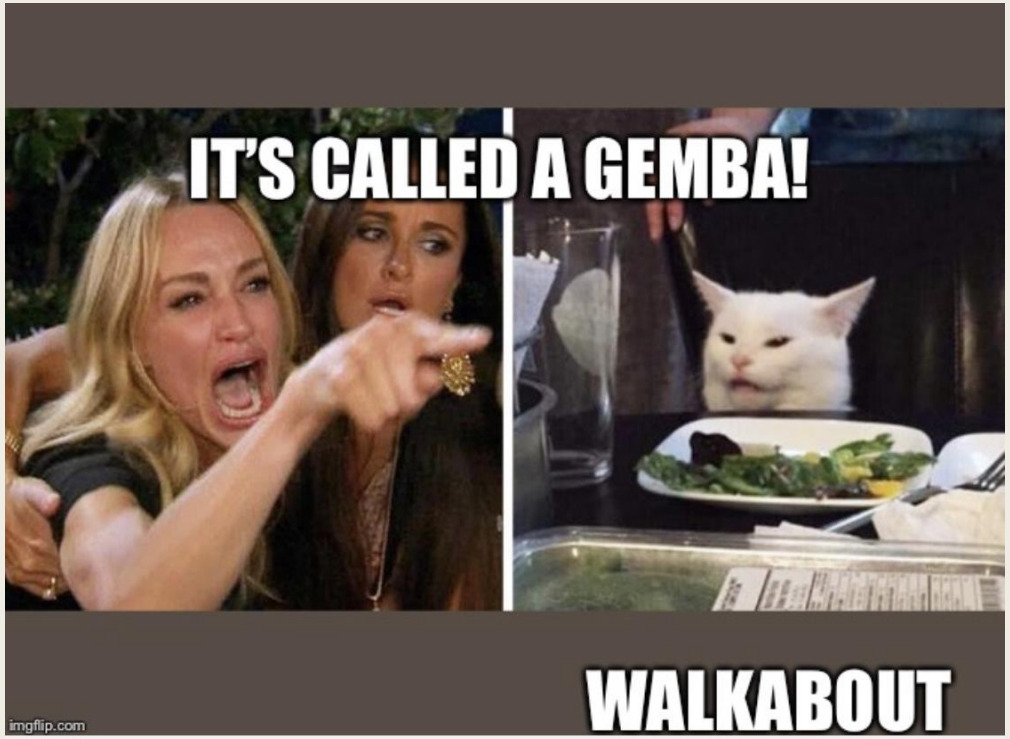
- Variation
- Waste
- Standard Work
- The Voices
  - *Customer, Process, Employee, Business, Agency*

The Toyota Way House



Leader Standard Work

- Gemba With A Purpose
  - *Good questions*
  - *Bad questions*
  - *Listening for what is said*
  - *Listening for what isn't said*
  - *Next best actions*
  - *Avoiding n=1 Bias*

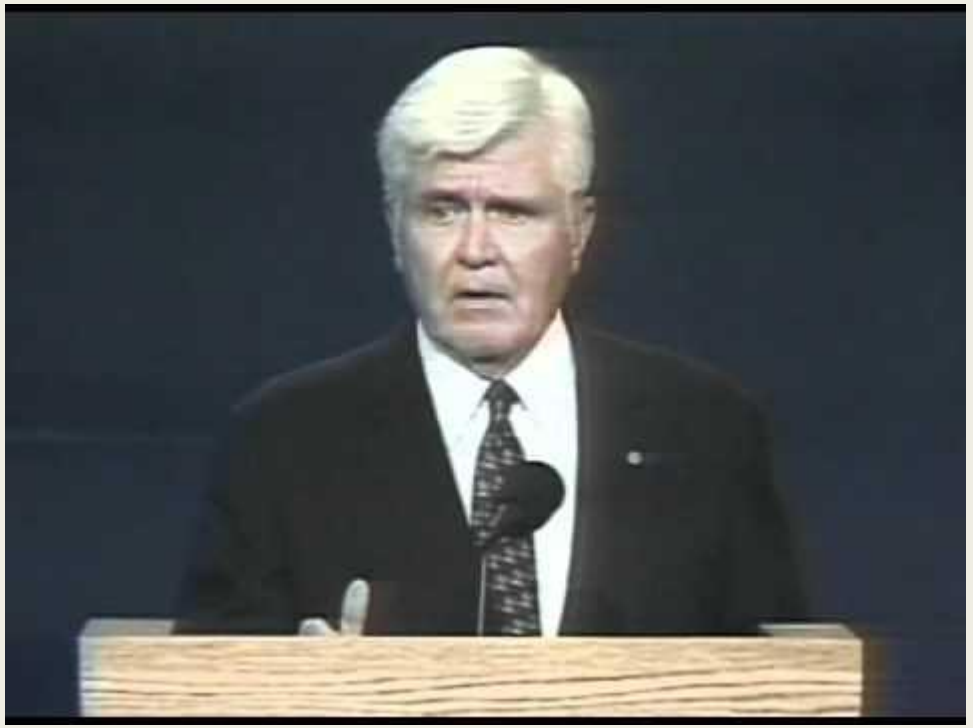


Capabilities / Capability Building

- Clearly defined and documented processes
- People – knowledgeable, experienced, engaged, valued
- Properly staffed
- Scorecard / Dashboard / KPIs / Metrics / OKRs
- Leadership & Management

Alternative Pillars of LSS

What is the purpose of a question?



Who am I?

Why am I here?

The quality of your life is directly proportional to the questions you ask of yourself and others

Pluralistic Ignorance

Pluralistic Ignorance:

Why does no one speak up in meetings when someone is talking nonsense? Because we all assume that everyone else must know something we don’t, so we all stay ignorant rather than asking a potentially embarrassing question. The most powerful thing to say in meetings can sometimes be…..

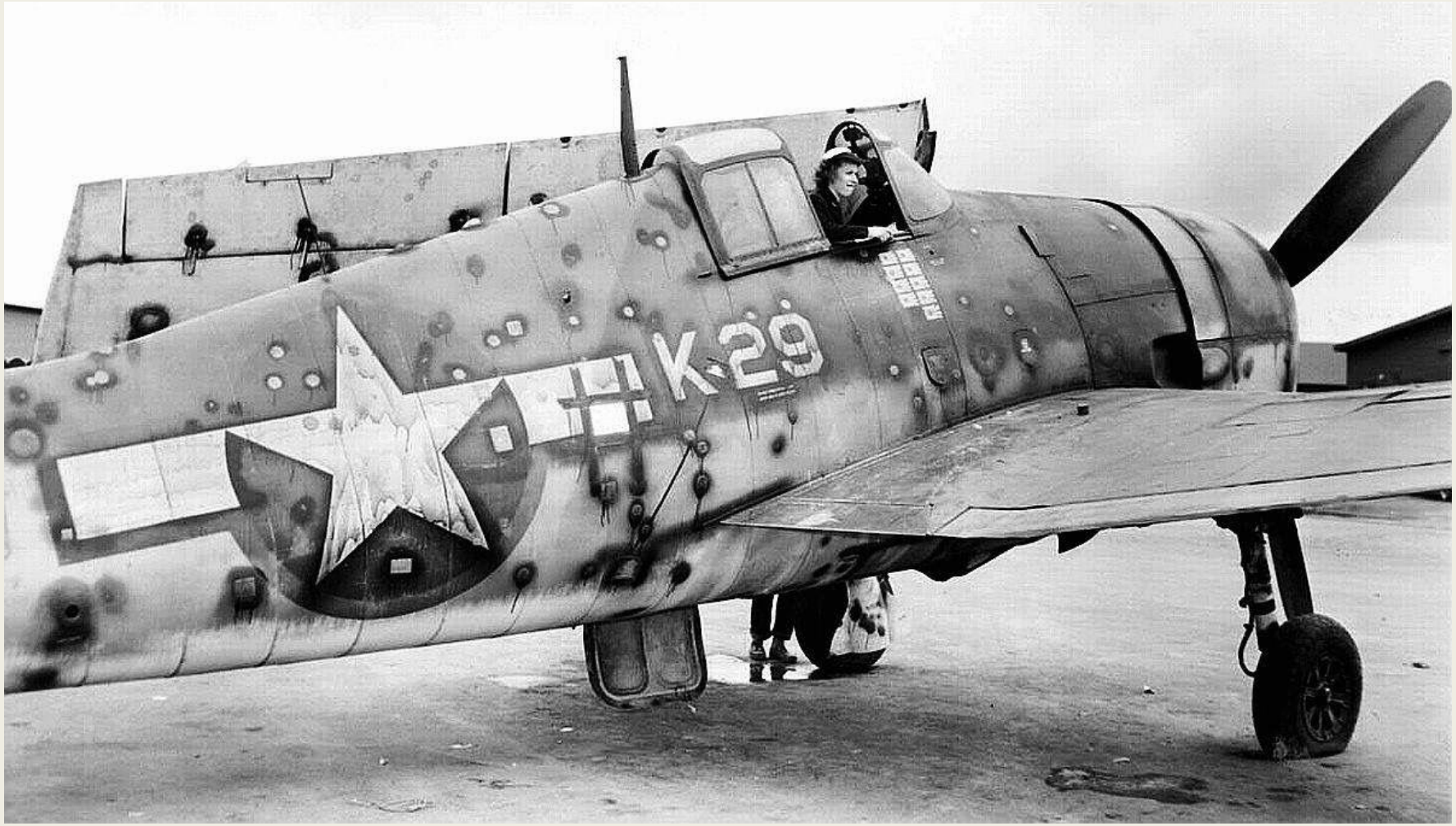
What does that actually mean?

Courage

Tell me more

Hints

- Born in 1902 in Transylvania
- In 1931 he was awarded a PhD in Mathematics from the University of Vienna
- Emigrated to the United State in 1938
- Major contributor to Decision Theory and Game Theory
- Member of SRG at Columbia University to use statistics to solve “Wartime Problems”
  - *SRG – Statistical Research Group*
- Died in a plane crash in 1950 at the age of 48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So here is the question:

You don’t want your planes to get shot down by enemy fighters, so you armor them. But armor makes the plane heavier, and heavier planes are less maneuverable and use more fuel. Armoring the planes too much is a problem; armoring the planes too little is a problem. Somewhere in between there’s an optimum. The reason you have a team of mathematicians socked away in an apartment in New York City is to figure out where that optimum is.

Critical Data

Section of plane	Bullet holes per square foot
Engine	1.11
Fuselage	1.73
Fuel system	1.55
Rest of the plane	1.8

And now, the rest of the story.....

Abraham Wald

Where are the missing holes?

What assumptions are you making?

Are they justified?

Survivorship Bias:

Survivorship bias is the logical error of concentrating on the people or things that made it past some selection process and overlooking those that did not, typically because of their lack of visibility. This can lead to false conclusions in several different ways.

Questions:

The art of seeking to understand

Brainstorming for questions rather than answers

Not All Questions Are Created Equal

- Traditional divergent-thinking techniques (for example, making random associations or taking on an alternative persona) can help unlock new questions and, ultimately, new territory.
- Questions are most productive when they are open versus closed, short versus long, and simple versus complex.
- Descriptive questions (what's working? what's not? why?) best precede speculative ones (what if? what might be? why not?).

Not All Questions Are Created Equal

- Shifting from simple questions that require only recall to more cognitively complex ones that demand creative synthesis produces better breakthrough thinking.
- Questions are annoying and distracting when they don’t spring from a deeply held conviction about what the group wants to achieve.
- Questions are toxic when they are posed aggressively, putting people on the spot, casting unwarranted doubt on their ideas, or cultivating a culture of fear.

Six Questions for Facilitating Smart Debates

- That's a good thought. Could you walk us through the process you went through to reach that conclusion?
- What rules should we be breaking here?
- What's our biggest risk in this, and what's our fallback position?'
- What if we did nothing at all–what would happen then?
- Are we missing or forgetting anything?
- Aside from earning us a profit, how would this decision change lives and make the world a better place?

Questions yield answers which may expose biases or misleading information

Biases

Tell me more about Biases

- There are nearly 200 different cognitive biases
- It is impossible to “de-bias” a person
- Key is recognizing a bias in as close to real time as possible and overcoming it to achieve a better outcome

Confirmation Bias

Confirmation bias is based on finding that people tend to listen more often to information that confirms the beliefs they already have. Through this bias, people tend to favor information that confirms their previously held beliefs.

This bias can be particularly evident when it comes to issues like gun control and global warming. Instead of listening to the opposing side and considering all of the facts in a logical and rational manner, people tend simply to look for things that reinforce what they already think is true.

In many cases, people on two sides of an issue can listen to the same story, and each will walk away with a different interpretation that they feel validates their existing point of view. This is often indicative that the confirmation bias is working to "bias" their opinions.

Hindsight Bias

Hindsight bias is a common cognitive bias that involves the tendency of people to see events, even random ones, as more predictable than they are.

This tendency to look back on events and believe that we “knew it all along” is surprisingly prevalent. Following exams, students often look back on questions and think “Of course! I knew that!” even though they missed it the first time around. Investors look back and believe that they could have predicted which tech companies would become dominant forces.

Hindsight bias occurs for a combination of reasons, including our ability to "misremember" previous predictions, our tendency to view events as inevitable, and our tendency to believe we could have foreseen certain events.

Anchoring Bias

We also tend to be overly influenced by the first piece of information that we hear, a phenomenon referred to as Anchoring bias or anchoring effect. For example, the first number voiced during a price negotiation typically becomes the anchoring point from which all further negotiations are based. Researchers have even found that having participants choose a completely random number can influence what people guess when asked unrelated questions.

This tricky little cognitive bias doesn't just influence things like salary or price negotiations. Doctors, for example, can become susceptible to anchoring bias when diagnosing patients. The physician’s first impressions of the patient often create an anchoring point that can sometimes incorrectly influence all subsequent diagnostic assessments. If you ever see a new doctor and she asks you to tell her your whole story even though everything should be in your records, this is why. It is often the physician, or analogously anyone trying to get to the bottom of a problem, who discovers a vital piece of information that was overlooked as a result of anchoring bias.

Misinformation Effect

Our memories of particular events also tend to be heavily influenced by things that happened after the actual event itself, a phenomenon known as the misinformation effect. A person who witnesses a car accident or crime might believe that their recollection is crystal clear, but researchers have found that memory is surprisingly susceptible to even very subtle influences.

In one classic experiment by memory expert Elizabeth Loftus, people who watched a video of a car crash were then asked one of two slightly different questions: “How fast were the cars going when they *hit* each other?” or “How fast were the cars going when they *smashed into* each other?”

When the witnesses were then questioned a week later, the researchers discovered that this small change in how questions were presented led participants to recall things that they did not actually witness. When asked whether they had seen any broken glass, those who had been asked the “smashed into” version of the question were more likely to report incorrectly that they had seen broken glass.

Actor Observer Bias

The way we perceive others and how we attribute their actions hinges on a variety of variables, but it can be heavily influenced by whether we are the actor or the observer in a situation. When it comes to our own actions, we are often far too likely to attribute things to external influences. You might complain that you botched an important meeting because you had jet lag or that you failed an exam because the teacher posed too many trick questions.

When it comes to explaining other people's actions, however, we are far more likely to attribute their behaviors to internal causes. A colleague screwed up an important presentation because he's lazy and incompetent (not because he also had jet lag) and a fellow student bombed a test because she lacks diligence and intelligence (and not because she took the same test as you with all those trick questions).

False-Consensus Effect

People also have a surprising tendency to overestimate how much other people agree with their own beliefs, behaviors, attitudes, and values, an inclination known as the false consensus effect. This can lead people not only to incorrectly think that everyone else agrees with them—it can sometimes lead them to overvalue their own opinions.

Researchers believe that the false consensus effect happens for a variety of reasons. First, the people we spend the most time with, our family and friends, *do* often tend to share very similar opinions and beliefs. Because of this, we start to think that this way of thinking is the majority opinion even when we are with people who are not among our group of family and friends.

Another key reason this cognitive bias trips us up so easily is that believing that other people are just like us is good for our self-esteem. It allows us to feel "normal" and maintain a positive view of ourselves in relation to other people.

Self-Serving Bias

Another tricky cognitive bias that distorts your thinking is known as self-serving bias. Basically, people tend to give themselves credit for successes but lay the blame for failures on outside causes.

When you do well on a project, you probably assume that it's because you worked hard. But when things turn out badly, you are more likely to blame it on circumstances or bad luck. This bias *does* serve an important role; it helps protect our self-esteem. However, it can often also lead to faulty attributions, such as blaming others for our own shortcomings.

Availability Heuristic

After seeing several news reports of car thefts in your neighborhood, you might start to believe that such crimes are more common than they are. This tendency to estimate the probability of something happening based on how many examples readily come to mind is known as availability heuristic. It is essentially a mental shortcut designed to save us time when we are trying to determine risk.

The problem with relying on this way of thinking is that it often leads to poor estimates and bad decisions. Smokers who have never known someone to die of a smoking-related illness, for example, might underestimate the health risks of smoking. In contrast, if you have two sisters and five neighbors who have had breast cancer, you might believe it is even more common than statistics tell us.

Pluralistic Ignorance

Pluralistic ignorance occurs when people erroneously infer that they feel differently from their peers, even though they are behaving similarly. As one example, imagine the following scenario:

You are sitting in a large lecture hall listening to an especially complicated lecture. After many minutes of incomprehensible material, the lecturer pauses and asks if there are any questions. No hands go up. You look around the room. Could these people really understand what the lecturer is talking about? You yourself are completely lost. Your fear of looking stupid keeps you from raising your hand, but as you look around the room at your impassive classmates, you interpret their similar behavior differently: You take their failure to raise their hands as a sign that they understand the lecture, that they genuinely have no questions.

These different assumptions you make about the causes of your own behavior and the causes of your classmates' behavior constitute pluralistic ignorance.

Observational Selection Bias

This is that effect of suddenly noticing things we didn't notice that much before — but we wrongly assume that the frequency has increased. A perfect example is what happens after we buy a new car and we inexplicably start to see the s*ame car* virtually everywhere. A similar effect happens to pregnant women who suddenly notice a lot of other pregnant women around them. Or it could be a unique number or song. It's not that these things are appearing more frequently, it's that we've (for whatever reason) selected the item in our mind, and in turn, are noticing it more often. Trouble is, most people don't recognize this as a selectional bias, and actually believe these items or events are happening with increased frequency — which can be a very disconcerting feeling. It's also a cognitive bias that contributes to the feeling that the appearance of certain things or events couldn't possibly be a coincidence (even though it is).

Recency Bias

Recency bias is the phenomenon of a person most easily remembering something that has happened recently, compared to remembering something that may have occurred a while back.

A sports network has a year-end special called the "Greatest Sports Plays of All Time". The show features the best ever plays from sports like football, baseball, basketball, etc. The show polls fans to develop a list of the best ever plays.

Each year, plays that occurred over the past year dominate the show. Did 70% of the greatest sports plays of all time really occur just over the past 12 months? Definitely not - this is an example of recency bias, as we tend the best remember the events that have occurred most recently.

Conservatism Bias

Conservatism or conservatism bias is a bias in human information processing, which refers to the tendency to revise one's belief insufficiently when presented with new evidence.

Conservatism bias is a mental process in which people cling to their prior views or forecasts at the expense of acknowledging new information.

Outcome Bias

Outcome bias is an error made in evaluating the quality of a decision when the outcome of that decision is already known.

If the forecast says there is a 10% chance of rain and you don't bring an umbrella, did you make a bad decision? If you look at live traffic on your map app and pick the fastest route, and then an accident causes a delay, did you make a bad decision?

The common assumption that these are bad choices is an example of outcome bias, or "resulting," where we evaluate our decision or our process based on the outcome alone.

Negativity Bias

People tend to pay more attention to bad news — and it's not just because we're morbid. Social scientists theorize that it's on account of our selective attention and that, given the choice, we perceive negative news as being more important or profound.

We also tend to give more credibility to bad news, perhaps because we're suspicious (or bored) of proclamations to the contrary. More evolutionarily, heeding bad news may be more adaptive than ignoring good news.

Today, we run the risk of dwelling on negativity at the expense of genuinely good news.

Bias Blind Spot

The bias blind spot is the cognitive bias of recognizing the impact of biases on the judgment of others, while failing to see the impact of biases on one's own judgment.

Occam’s Razor

Occam's razor is a principle from philosophy.

Suppose there exist two explanations for an occurrence. In this case the one that requires the least speculation is usually correct.

Another way of saying it is that the more assumptions you have to make, the more unlikely an explanation.

Hanlon’s Razor

Hanlon's razor is an aphorism expressed in various ways, including:

"Never attribute to malice that which is adequately explained by stupidity.“

It is a philosophical razor which suggests a way of eliminating unlikely explanations for human behavior.

Biases & Half-Truths

Truth

- How do we know anything?
  - *Someone told us*
  - *We read it from a “reliable” source*
  - *It was taught in school by someone we “trusted”*
  - *Direct observation*
    - And the assumption of having a perfect recall memory

Misleading / Fake Data

- Auto Insurance commercials
- Mutual Fund information
- Political ads
- Videos
  - *Commentary does not match content*
- Always / Never Fallacy
- Insufficient Sample Size
- Non-Normal Data Set
- Emphasis on “average”

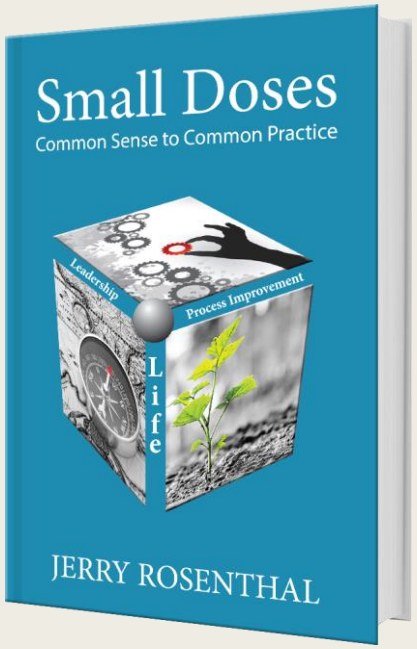
Summary

- Ask good questions: what do I wish to know that I don’t know already and can’t easily be found elsewhere
- Recognize biases and find ways to overcome them by starting with yourself and someone you trust
- Challenge the data: does this make sense and can it be looked at in another way

When did you arrive?

My Book & Newsletter

- Small Doses: Common Sense to Common Practice
  - *Process Improvement, Leadership & Life*
  - *https://www.amazon.com/Small-Doses-Common-Sense-Practice/dp/1942489749/*
- Smaller Doses
  - *Stories and examples Leadership & Life*
  - *Smallerdoses.substack.com*
    - Launched on 10/10/19
    - 3rd Smaller Dose will be published on 11/24/19



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Bibliography

References

Bibliography