Intro to Critical Thinking

Goal of this class:

Improve your thinking and your success in life by:

Introducing you to what is Critical Thinking and why you should care

Showing you how each of our life experiences creates a lens for how each of us view the world around us and how it creates bias in each of us

Improving your understanding that most forms of media as well as input from everyone with whom we interact likely comes with biases and this may affect the quality of information we receive

Seeking out information & knowledge that come from quality sources with differing perspectives thus improving your Critical Thinking leading to better decision-making.

Class outline – next 3 weeks

Goals of this class

What is Critical Thinking?

What isn't Critical Thinking?

Why is Critical Thinking important?

What is fundamental to Critical Thinking?

Barriers to Critical Thinking

Understanding our personal biases

Sources of Information - bias & quality

Understanding data

Understanding probabilities

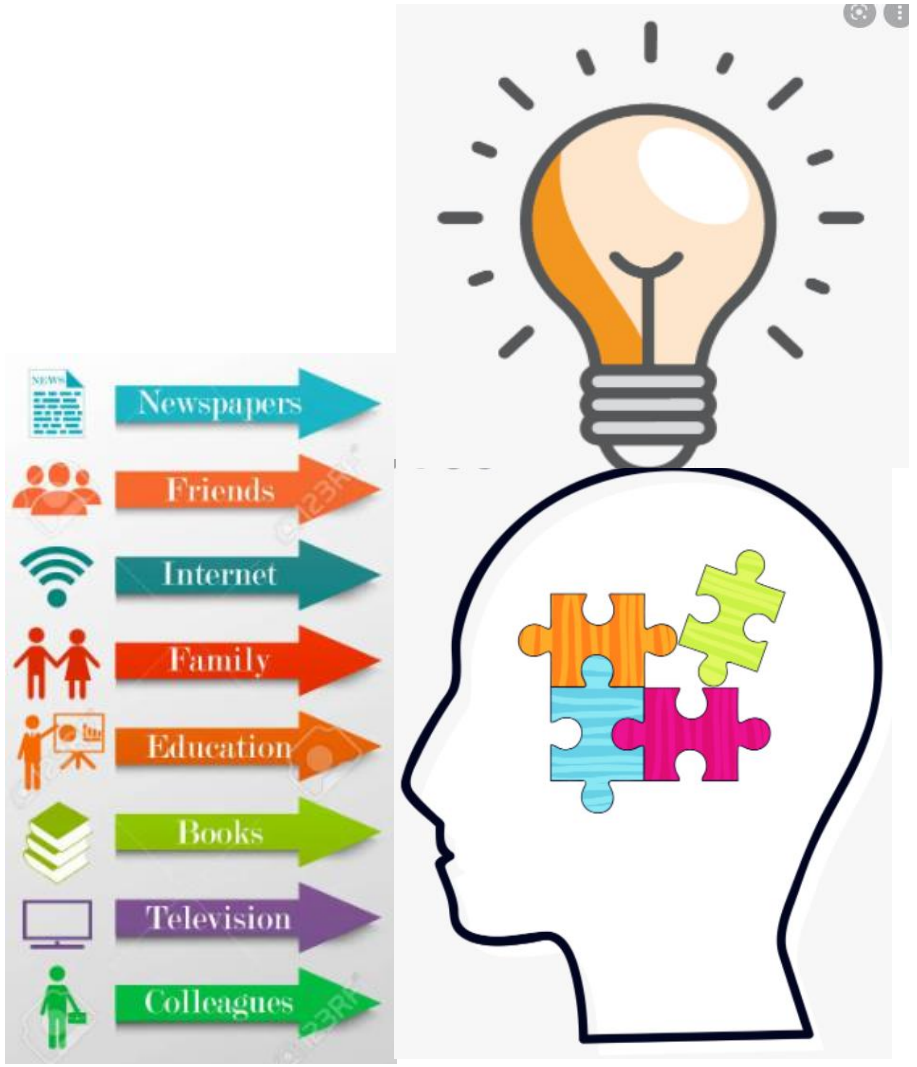
In-class discussions of recent events to see biases & improve Critical Thinking

Practices to improve Critical Thinking

Exercises in Critical Thinking

What is Critical Thinking?

Critical Thinking is the ability to think clearly & rationally by evaluating several different sources of information objectively to make informed decisions.



Critical thinkers will…

- identify and clarify a problem or opportunity
- collect data and/or information from several sources and perspectives
- evaluate the quality and validity of the data & information
- use this data & information to analyze & solve problems or look at opportunities systematically rather than by intuition or instinct.

What isn't Critical thinking?

Making decisions based on emotion or gut feel based on your biases – "I feel…"

Simply accepting comments by others or articles on the internet or other media without examining their validity

Making decisions based on one source of information, particularly from biased or poor-quality sources

Making decisions based on rules-of-thumb – "It usually…."

Making decisions without listening to or reading arguments coming from different perspectives "I don't care what you say…"

Many people seek out news and information that supports their gut feel and biases and they reject news and information that doesn't support their gut feel / bias as untrue without really examining both types for validity

Why is Critical Thinking important?

Critical Thinking helps you make the best decisions for you and others!!!

It is valued by individuals, organizations & businesses likely leading to your views being accepted and your recommended action steps being executed

- It is a skill that organizations want in their leaders and advisors
- This skill will likely lead to promotions, financial bonuses, & awards over your lifetime

It pays in many ways to be a Critical Thinker!

What is fundamental to Critical Thinking?

Being able to formulate an understanding of the key issue

Sticking to a systematic method to collect information, analyze it, & draw conclusions

Willingness to spend the time & effort to gather information that both supports and refutes your initial thoughts and biases on the matter

Spending the time & effort to organize the information in a way that allows you to effectively evaluate it objectively before drawing any conclusions

Not letting your emotions get in the way and drive your decisions

Having an open mind and willingness to listen to others with different perspectives

Barriers to Critical Thinking

Your conscious & unconscious bias

Not investing the time & effort to collect diverse information for your analysis & conclusions

An over-reliance on feelings or emotions

An over reliance on what you think to know

(For those of you have taken the Decision Science class, remember all the quotes from very smart people or organizations that missed tremendous opportunities or made mistakes because they felt they "knew better")

Self-centered or societal/cultural-centered thinking (conformism, dogma and **peer-pressure**)

Who here has had to argue both sides of an argument?
What was your experience?

Understanding your bias

Your view of the world around you is shaped by your life experiences to date!!!

Think about how I might view the world and interpret things I see, hear, and read if I said:

"I grew up in the USA in a white, middle class, republican, Christian home with a traditional family structure, loving parents, and no drama."

Now just changing even one of those facts might make a significant difference in how I might see the world. Try substituting the following or your situation and think how that might change how I would see the world and interpret things I see, hear, and read…

Haiti Mexico Russia China Africa …	Black Hispanic Indian ….	Rich Poor …	Democrat Libertarian Extremist …	Muslim Hindu Buddhist Agnostic Atheist …	Non-traditional family structure	An environment full of drama and/or pain e.g. alcoholism, drug use, abuse, crime

Some of your biases can and likely will change over time

To the extent that you…

- are exposed to people, situations, and things that are different
- you have a significant emotional event
- you make a conscious decision to look at people and things from different perspectives

some of your biases will likely change.

What if I added to the previous slide….

"After graduating from middle school, I was a minority student in high school and during my career I traveled extensively all over the world meeting and working with people from many different cultures and in many different situations."

How might this change my view and biases?

Can you think of events in your life that changed how you look at things?

Critical Thinking – Media Example 1

Headline:

42% increase in shark attacks in Florida in 2021 compared with 2020

Your thoughts?

Will your thoughts influence whether or not you will go in the Gulf if you are at the beach? Why or why not?

For our shark attack question and decisions, you collect some data…

Per CBS News:

"There have been an average of 25 shark attacks in Florida over the last 5 years."

"That number ticked to 28 in 2021."

"17 of those attacks took place in Volusia County"…
"which includes Daytona Beach"

Per Outdoor Life:

"Florida Accounted for Nearly 40 Percent of Shark Attacks Worldwide in 2021"

"Human-shark encounters increased globally in 2021 after three years of decline"

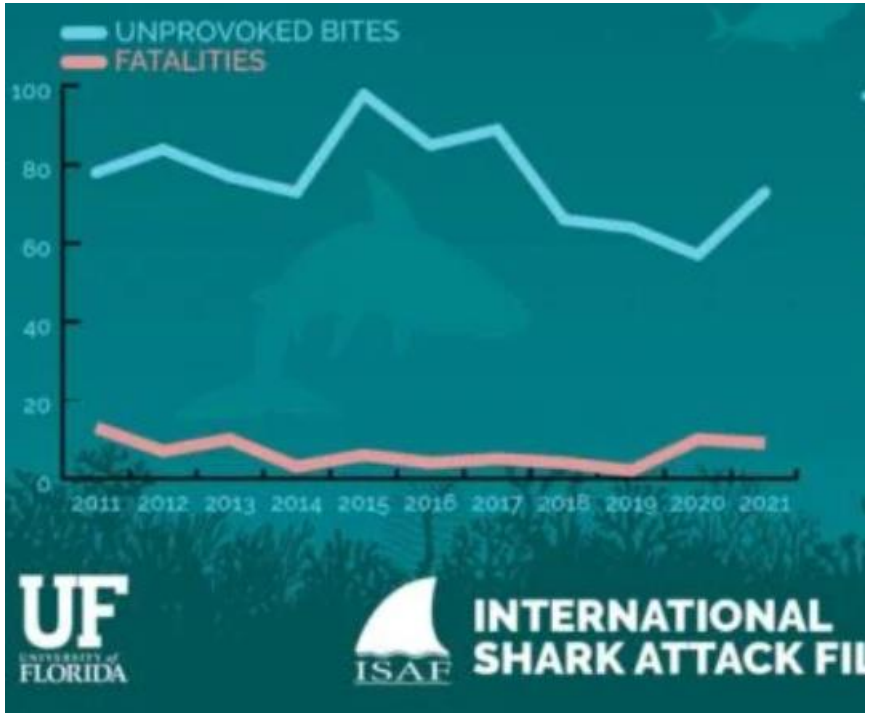
Per USA Today:

"2020 was an 'unusually deadly year' for shark attacks, with the most deaths since 2013"

You find that many of the articles draw from the following data source:

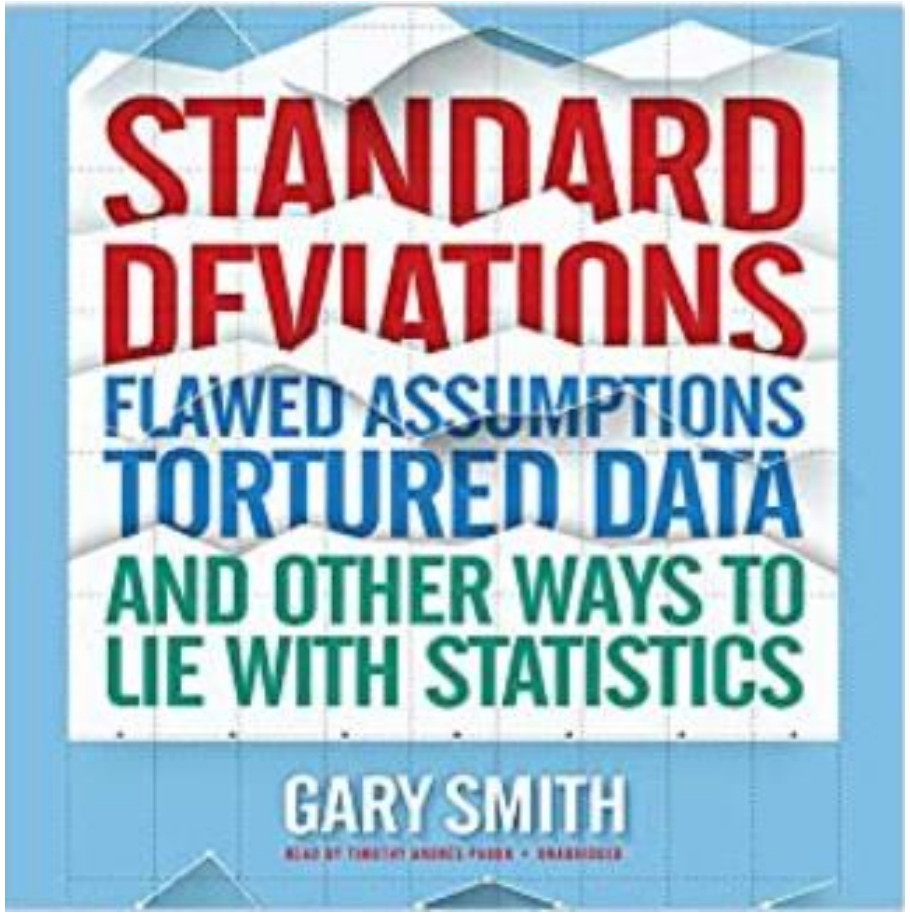
International Shark Attack File – Florida Museum of Natural History (ufl.edu)

Worldwide



Understanding data

When tortured, the data will confess to anything!



To be a critical thinker, it is important to gather data and information from multiple sources if available and look at it from different perspectives.

If you are looking for data to simply support a "gut-feel" position you have, you are not thinking critically.

Many if not most of the articles you hear and read have been written in a way to sway you to the author's position on the matter

Frequently parts of the data are emphasized to "sensationalize" an article to pull you in to reading and/or to convince you to take the author's position

You examine the shark data and do some analysis…

From the data from generally reliable sources, you know there were 28 attacks in 2021 and that was a 42% increase.

Relying on your algebra ☺ Assume X is # of shark attacks in 2020.

X* (1+42%)= 28 attacks

1.42*X = 28 **Therefore X = 20 attacks in 2020**

You also know there was an average of 25 over the last 5 yrs.

Now let Y = the average # of attacks between 2017 and 2019

25 attacks/yr. = ((3*Y)+ 20 + 28)/5

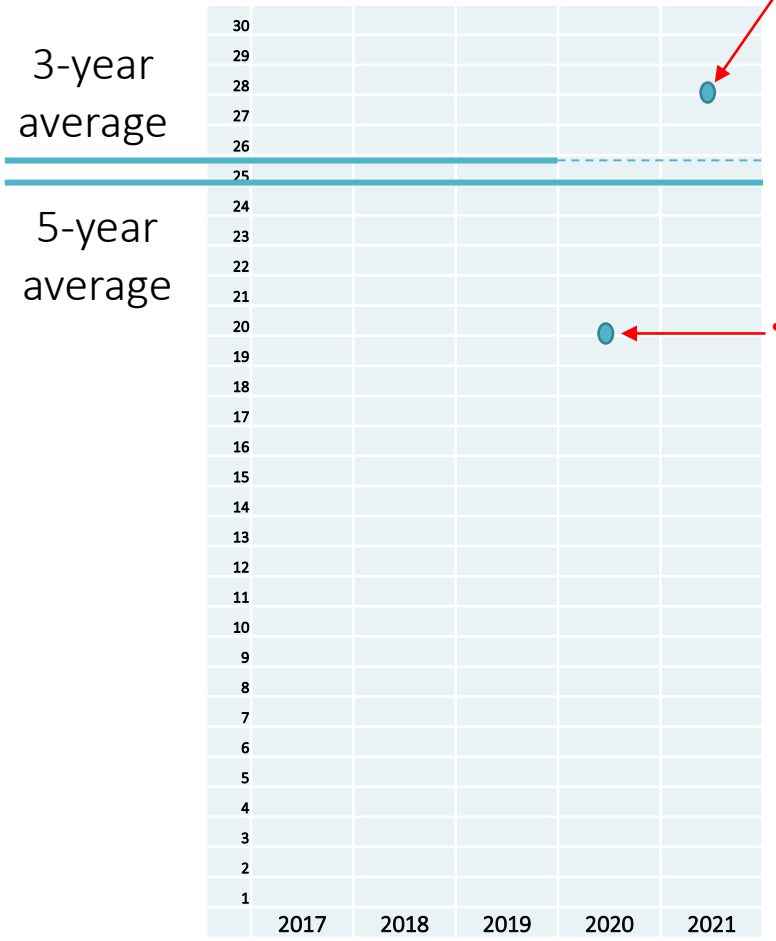
125= 3*Y+20+28

125=3*Y +48

77 = 3*Y

Y = 25.7

25.7 was the average from 2017 through 2019



(28-25.7)/25.7
= 1.3/25.7
= .09
= **9% increase**
over 2017-2019 avg.

(20-25.7)/25.7
= - 5.7/25.7
= - 0.25
= **22% decrease**
compared with 2017-2019 avg.

What are your conclusions?

Shark attack conclusions and next steps

The headline… "***42% increase in shark attacks in Florida in 2021 compared with 2020"*** while true, is misleading with likely intent to grab your attention to read the article

Are shark attacks really increasing?

- One would need to look at more data and do a statistical analysis to know for sure.
- Secondly if you wanted to understand your personal risk over time, you would have to understand how many people-hours in the water for each year to know if shark attacks were increasing on a person-hour in the water basis
- What else would you need to know if sharks were becoming more aggressive?

With the facts present in the article, it appears the more interesting point statistically is the 20 attacks in 2020?

What may have accounted for that?

Understanding probabilities

Let's hypothetically say you performed a very thorough analysis and found shark attacks might be increasing on a per year basis…should you avoid going in the water?

Comparison of Unprovoked Shark Attacks with the Number of Lightning Fatalities in Florida : 1959-2010

	NUMBER OF LIGHTNING FATALITIES	NUMBER OF SHARK BITE FATALITIES
Florida	459	9
	51:1	

Source of shark attack data:
International Shark Attack File.
Source of lightning data: Lightning Fatalities, Injuries and Damage Reports in the United States from NOAA.

A Comparison of Shark Attack and Bicycle-Related Fatalities 1990-2009

FLORIDA BICYCLE INJURIES	FLORIDA SHARK BITE INJURIES	FLORIDA BICYCLE FATALITIES	FLORIDA SHARK BITE FATALITIES
112,581	439	2,272	4
258:1		568:1	

Source of bicycle injuries and fatalities data:
NHTSA Fatality Analysis Reporting System
Florida Department of Highway Safety and Motor Vehicles
Source of shark attack data: International Shark Attack File

What are your conclusions?

Week 1 Summary

- Critical Thinking is the ability to think clearly and rationally by evaluating several different sources of information objectively to make informed decisions.
- Critical Thinking involves a clear understanding of the problem or opportunity, researching the relevant data and information from multiple sources with differing biases, analyzing this input for validity, using this data and information to analyze and solve problems or look at opportunities systematically rather than by intuition, instinct, or emotions.
- Critical Thinking helps you make the best decisions for you and others.
- It is valued by individuals, organizations and businesses likely leading to your views being accepted and your recommended action steps being executed
- We saw a Critical Thinking example where the headlines of a story, while true, was misleading as to what was likely happening statistically and the likely real story
- We saw how one can be directed to focus on a scary issue which may be very improbable compared to things we do today with similar negative outcomes.